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STATE OF COLORADO

## BUREAU OF MINES

State Capitol, Denver

JOHN T. JOYCE, *Commissioner of Mines*

# ANNUAL REPORT

for the Year 1930



BRADFORD-ROBINSON PRINTING CO.

DENVER, COLORADO

1931



STATE OF COLORADO  
BUREAU OF MINES  
State Capitol, Denver

JOHN T. JOYCE, *Commissioner of Mines*

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ANNUAL REPORT

for the Year 1930



Mrs. Fred Smith.  
Gift of  
J. J. Hoelzel.  
J. J. Hoelzel.

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**LETTER OF TRANSMITTAL**

To His Excellency,

THE HONORABLE WILLIAM H. ADAMS,  
Governor of Colorado.

Sir: In compliance with Section 3392 of the Compiled Laws of Colorado, 1921, I have the honor to transmit herewith the Annual Report of the State Bureau of Mines for the year 1930.

Respectfully submitted,

JOHN T. JOYCE.  
Commissioner of Mines.

State Capitol,  
Denver, Colorado,  
May 18, 1931.

# PERSONNEL OF THE BUREAU OF MINES OF THE STATE OF COLORADO

JOHN T. JOYCE, Commissioner of Mines.....	Denver
GEORGE BECKER, Inspector, District No. 1.....	Denver
HERRICK McLEOD, Inspector, District No. 2.....	Cripple Creek
R. J. MURRAY, Inspector, District No. 3.....	Salida
J. F. CLOUGHER, Inspector, District No. 4.....	Silverton
J. B. ANNEAR, Chief Clerk.....	Denver
MRS. A. M. NICKERSON, Stenographer and Assistant Clerk .....	Denver

## DISTRICTS OF INSPECTION

DISTRICT No. 1—<sup>a</sup>Adams, Arapahoe, Boulder, Clear Creek, Denver, Gilpin, Grand, Jackson, Jefferson, Larimer, Logan, Moffat, Morgan, Phillips, Routt, Sedgwick, Washington, Weld and Yuma Counties.

DISTRICT No. 2—<sup>b</sup>Baca, Bent, Cheyenne, Crowley, Custer, Douglas, Elbert, El Paso, Fremont, Huerfano, Kiowa, Kit Carson, Las Animas, Lincoln, Otero, Prowers, Pueblo and Teller Counties.

DISTRICT No. 3—<sup>c</sup>Chaffee, Delta, Eagle, Garfield, Lake, Mesa, Park, Pitkin, Rio Blanco and Summit Counties.

DISTRICT No. 4—<sup>d</sup>Alamosa, Archuleta, Conejos, Costilla, Dolores, Gunnison, Hinsdale, La Plata, Mineral, Montezuma, Montrose, Ouray, Rio Grande, Saguache, San Juan and San Miguel Counties.

On August 2nd, 1928, all former Departmental orders of temporary transfers from one district to another were vacated and in lieu thereof the following temporary changes in the different districts were made by order of the Commissioner of Mines, to-wit:

<sup>a</sup>All of the county of Summit and that part of Park County lying north and west of a line drawn from the southwest corner of Jefferson County to the southwest corner of Park County were temporarily transferred from District No. 3 to District No. 1.

<sup>b</sup>That part of said Park County lying south and east of said line was temporarily transferred from District No. 3 to District No. 2.

<sup>c</sup>That part of Gunnison County in the extreme northwest corner and lying north of the 39th degree of latitude, that part of Saguache County lying south and east of the Continental Divide and all of the counties of Mineral, Rio Grande, Conejos, Alamosa and Costilla were temporarily transferred from District No. 4 to District No. 3.

<sup>d</sup>All of the counties of Mesa and Delta were temporarily transferred from District No. 3 to District No. 4.

The remainder of all said districts to be left intact as now established by law until further changes are made by order of the Commissioner of Mines, or by the legislature of the State of Colorado.



## INTRODUCTION

The activities of the Bureau of Mines during 1930 were confined to the usual routine, no funds for any special work being provided.

The four inspectors visited practically all of the operating metal mines, quarries, mills, smelters and railroad tunnels at least once during the year. Most of the larger operations were inspected more than once. The object of these inspections is to eliminate, as far as possible, unsafe conditions and practices in the operation of such properties. In general, this work meets with the lively co-operation of the operators.

The Commissioner and Inspectors are anxious to help the mining industry in every legitimate manner and wish to be called upon whenever their services can be used.

Inquiries regarding the mines and mineral resources of the state and questions regarding the demand and market for less common mineral products are constantly coming into the Bureau. An earnest endeavor is made to furnish the information desired. Helpful co-operation is often received from the Colorado Geological Survey, the United States Bureau of Mines and the United States Geological Survey.

The Commissioner takes this opportunity of expressing his appreciation of the loyal and efficient services that have been rendered by the entire personnel of the Bureau during the past year.

## METAL MINING IN 1930

The metal mining industry is basic. It is one of the greatest contributors to our national wealth. As a necessity of life, it enters into every branch of industry; it is necessary to our happiness; it supplies by far more than half of the freight handled by railroads and other transportation agencies; it contributes, through various means of taxation, magnificently to our public coffers and furnishes employment to millions of workmen throughout the nation. It was this industry that laid the foundation for Colorado's commercial greatness. During the past year, in common with other industries, it has felt the deterrent effects of the present general economic depression. The inevitable result has been suspension and curtailment of production, particularly in the industrial metals, and a slowing up of development work with a corresponding decrease in general activity throughout the mining districts of the Western fields.

Yet judging from the annual review by the four state metal mine inspectors of mining operations in their respective districts, appended as part of this report, the condition of the mining industry in Colorado as compared with other sections of the country dependent upon other industries is most encouraging and far above the general average.

While the preliminary compilation of the annual production of the mines in Colorado for the year 1930, by Mr. C. W. Henderson of the Federal Bureau of Mines, shows an increase in the neighborhood of one hundred thousand dollars in gold, comparatively a stand off in molybdenum and vanadium, and a heavy decrease in silver and the industrial metals, owing to the heavy decline in market prices thereof, the reports of the Mine Inspectors mentioned reveal that mining activities in their respective districts were far greater than the production figures indicate.

The attention of this department has frequently been called through correspondence and interviews to current reports which seem to prevail generally throughout Eastern financial and industrial circles, that Colorado can no longer be regarded as a mining state; that its mineral resources have been thoroughly exploited and its mines exhausted; that it is and has been essentially a silver-producing state and ranked exceedingly low in the production of gold—a report so unwarranted, so false and infamous that “it cries to high heaven,” and is entirely unsupported by the facts and existing conditions when they are understood from the viewpoint of mining.



For 40 years preceding the year 1918, the average production from the mines of Colorado was about \$35,000,000 in round numbers. From 1897-1918 five smelters were in operation handling upwards of 2,400 tons a day. Between the years 1919 and 1921 smelting operations were suspended by three of these smelters and the mine production dwindled from the average above given to \$14,000,000, a decline of \$21,000,000 in the short space of two years. These three smelters did not only suspend operations, but they were later torn down and junked, with the exception of the Globe smelter at Denver, which was converted into an arsenical plant. This action, as I have stated in former reports, marked the real beginning of the downward trend of mining in this state.

First, in refutation of this report in reference to gold: When one speaks of Alaska it is thought of in terms of gold, where, as a matter of fact, as revealed by the reports of the United States Geological Survey, the United States Bureau of Mines and the American Bureau of Metal Statistics, the first eight years of the past decade, beginning with the year 1920, show that the gold production of Colorado was greater than all of Alaska combined, ranking second among the metal-producing states, California alone leading, and the decline of gold production for the remaining three years was largely caused by the falling off in the mining of our low-grade sulphides occasioned by the fact that the operators were deprived of home facilities for the final reduction of their products which all contain more or less values in gold.

Second, in reference to the rumored exhaustion of our mines and mineral resources: In contradiction of such false reports and in order that this matter may be clearly understood, the following tabulation for comparative purposes has been prepared to show the total tonnage of ore produced by our mines and treated at the smelters of the state in the years 1913 and 1928. Figures for the year 1928 are exclusive of Cripple Creek gold and silver ores treated at local mills in Cripple Creek and Colorado Springs, placer gold and zinc concentrates treated at zinc plants. The figures for the year 1913 are representative of that year and many preceding years. The compilation is based on official reports above mentioned, and the 1928 figures are taken because those for 1929 and 1930 are not available. In 1928 the tabulation shows the total amount of ores produced by the mines of Colorado, treated at the two smelters and concentrating mills of the state; the amount of zinc concentrates that were shipped to outside zinc plants; the daily tonnage shipped to smelters; the total values thereof and the average value per ton of complex ores smelted.

The table follows:

### TONNAGE

#### 1913

Tons of crude ores smelted.....	664,998
Tons of concentrates smelted.....	218,291
Total .....	883,289
Daily average—2,420.	
Zinc tonnage to outside plants not available for 1913.	

#### 1928

Tons crude ore smelted.....	82,876
Tons crude ore milled.....	712,490
Concentrates therefrom .....	158,736
Total ores and concentrates treated.....	241,612
Less zinc concentrates to zinc plants.....	70,830
Total crude and concentrates smelted.....	170,782
Average daily tonnage of all ores and concentrates treated	660
Tonnage decline from 1913.....	641,677
Average daily decline.....	1,760

### VALUE

Total value 1913.....	\$35,450,585
Total value 1928.....	16,375,355
Decline .....	\$19,075,230
Total value ore production in 1928.....	\$16,375,355
Less Teller County gold ores .....	\$ 3,070,203
Less placer gold .....	61,400
Less zinc concentrates to zinc plants .....	4,359,182      7,490,785
Total value derived from 170,782 tons smelted.....	\$ 8,884,570
Average value per ton treated by smelter.....	\$ 52.00

In 1913, 24,000 men, in round numbers, were employed in and about the mines of this state; in 1930 less than 5,000 men were employed.

In reference to the average shown in the table: It is evident a considerable tonnage of ores of a lesser grade were treated at the home smelters, but from the best information obtainable from the shippers of the state it is safe to assume that only in a few instances ores of less than \$25.00 a ton were profitably treated, and, in such cases, they were of a very desirable class of smelting ores, especially for fluxing purposes.

Thus it appears that, in order to have ores treated at a profit at the two smelters operating in this state, the values thereof must equal or exceed a general value of \$25.00 per ton in all metals, to insure a profit for the producer.

According to a paper read at the National convention of the American Zinc Institute held in St. Louis on April 16 and 17, 1928, and prepared by J. O. Elton, noted metallurgist and manager of the International Smelting and Refining Company's plant at Tooele, Utah, an extract of which appears on pages 9 and 10 of the annual report of this department for the year 1928—six plants in Utah were at that time treating 4,000 tons of ore daily, whose average, as quoted in his paper at the average price of metals for that year, was about \$10.00 per ton.

To the observing the enormous difference in the average value of the ores treated at the Colorado plants as compared with the Utah plants is plain and explains conclusively the decline of mining in Colorado as compared with other states, because of the lack of plants similar to those in Utah and other states to handle their low grade ore.

Practically all of the complex ore mines in the state of Colorado, and they are numerous, whose ores average less than \$25.00 per ton, are idle and cannot ship to the Colorado smelters with any hope of profitable returns, with the exception of the few mines that are equipped with their own mills, and others that are in close proximity to custom flotation plants, and there are really only two in the state which can be so classed.

It is obvious that once a plant is established which can handle \$10.00 to \$15.00 ore, the tonnage shipped to such a plant would in a very short time far exceed the tonnage shipped to smelting plants in Colorado for any previous year.

The skeptic may raise the cry—Where are you going to get the ore? In reply I may say that anyone who is well acquainted with the history of Leadville mines and their possibilities is convinced that Leadville alone, with extended developments, will keep such a plant in operation for generations to come, without mentioning the deposits of low grade ores in the counties of

Eagle, Summit, Gunnison, Hinsdale, Ouray, San Miguel, Dolores, Grand, the five frontier and other counties teeming with large veins and deposits of this grade and character of ore.

How anyone can place credence in such fallacious reports and be led to believe that all the great mines of all these counties became exhausted with practical simultaneity is beyond the power of human conception.

As it is the purpose of this article to deal principally with the low grade complex ores of the state, we have omitted from the foregoing all of the gold and silver ores produced at Cripple Creek in Teller County, which are now being treated at the Golden Cycle mill at Colorado Springs. A large part of these ores run less than \$5.00 a ton, returning a profit both to the mill operators and the producers. They have recently installed a flotation unit by means of which they can handle low grade, complex ores and are in the market for ores of these classes. Further, their success goes a long way to prove what may be accomplished by employing modern methods in the treatment of low grade ores.

In the last few months this office has received more inquiries regarding mining in the state of Colorado than we have in the past five years combined, which indicates a trend of thought in financial and industrial circles toward mining investment. This, coupled with the fact that mining men of this state are giving proof of their confidence in the future of mining by the large amount of development and preparatory work under way for future operation, confirms my firm belief that the mining industry is due for a remarkable recovery as soon as there is substantial evidence of relief from the present economic depression.

In the final analysis, the solution of the problem which confronts the mining industry today permits of but one answer—an up-to-date, modern, metallurgical reduction plant for the treatment of our low grade ores, at some central point within the state to which these ores can be shipped at the lowest possible freight rate.

This would stimulate the building of contributory modern concentration plants in districts far removed from this central plant. Nearby districts could ship their milling, as well as crude ore, directly to the main plant.

With an abundance of ores in our mines to keep such a plant in operation for coming generations, why does not the state of Colorado awaken to the opportunity that is knocking daily at its door?



## CONDENSED REVIEW OF MINING DISTRICTS

By State Mine Inspectors

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### District No. 1, by George Becker

During the past year the mining industry in District No. 1 suffered very much from the low price of metals and the general depression, which caused most of the mines to curtail production. Only those where gold values predominated were able to operate with any degree of success. Judging from the numerous inquiries for metal mines in 1930, it would indicate that the coming year will show greater activity in mining.

**Boulder County**—Fifty mines were operated during the year, most of which produced some smelter and mill ore. The Alaska Tunnel near Ward was one of the principal prospects under construction, their objective being to develop the B and M vein system. When this is accomplished it should become a large producer.

The tungsten district has suffered from the slump in the price of tungsten, which has caused the curtailment of production, with only enough men working to keep the mines in repair, and to prevent them from filling with water.

The Argo, Emmett and Brown mines, operated by the Climax Spar Radium Co., J. H. Hardy, Manager, produced 20 tons daily of fluorspar, which was treated in their mill at Jamestown.

There are a number of new projects under way in this county that should add to the production the coming year. Also, a number of prospects have developed new deposits of ore.

**Clear Creek County**—Forty-nine mines were operated during the year, nearly all of them producing some smelter and mill ore.

The Mattie mine and mill, operated by the Mattie Consolidated Mines, Inc., R. R. Mitchell, Manager, produced 75 tons daily mill ore and some crude smelter ore. They sank the shaft an additional 100 feet, making 1,200 feet in all. Development on this level showed the veins and values extending to the 12th level, showing ore in sight for continued operation for some time to come.

The West Gold mine and mill, operated by the West Gold Mining Co., has been operating successfully, treating 75 tons daily since starting their new cyanide mill. B. M. McCartney in charge.

The Continental mine and mill of the Western States Mining Co., John E. Martelon, Manager, operated continuously during the year.

A number of prospects have been developed that show new deposits of ore.

**Gilpin County**—Thirty-eight mines were operated during the year, most of which produced some smelter and mill ore.

The Chain O Mines group and mill, operated by the Chain O Mines, Inc., Dr. Wm. Mark Muchow, Manager, was the largest producer in the county, operating at full capacity, mining and milling 1,000 tons daily. They have recently added another 500-ton unit, making a 1,500-ton plant, which is one of the most up-to-date plants in the state. It is operated very successfully under the supervision of J. M. Tippet, with ore developed sufficient to assure operating for years to come.

The Pittsburgh mine and mill, operated by the Ute Mining Co., J. H. Turner, Manager, has recently completed a mill and should be operating soon on dump ore.

The Egyptian, Great Mammoth and Bullion mines have been doing development work continuously during the year. They have developed new ore bodies, most of which are in virgin territory.

There are a number of new projects under way in this county that will add to the production the coming year.

**Grand County**—This county has a very large undeveloped mineralized area showing the most extensive outcroppings of fissure veins in the state, if not in the world. Six mines were operated during the year. The territory to the south of Fraser and the head of Williams Fork and Jones Pass offers one of the best fields in the state for a prospector.

The Mt. Vasquez mine, owned and operated by J. D. Milliken, shows one of the largest outcroppings of a mineralized fissure vein in the state. With proper development the mine should become one of the largest producers in Colorado.

The Elk Mountain mine, owned and operated by N. C. Hufaker, has been developed and shows a large deposit of good copper mill ore.

This county has not received the attention it deserves.

**Jackson County**—Is noted for its copper, lead and zinc deposits. Doing mostly development work on a small scale. Five mines were operated in this county. The values justify further development.



There are numerous fluorspar deposits and the spar is of the best quality.

**Jefferson County**—Sixteen clay mines were operated during the year. The non-metallic branch of the mining industry is increasing, giving employment to 500 men connected with the mines and plants in Denver. The State Mine Inspectors have as much work in looking after the safety conditions in clay mines and plants as they have in many of the metal mines.

**Larimer County**—Eight mines were operated in the Manhattan district during the year. The small amount of development done shows well defined fissure veins carrying mostly gold values. The marvelous surface showing indicates the existence of rich gold deposits. This district has not received the attention it deserves.

**Moffat County**—This county has a number of prospects that show well defined fissure veins, carrying good values in complex ores. These mines would become good producers if there was a market established to encourage the mining of this kind of ore. There is a large area to the north and northwest of Craig that contains rich placer gold. The placer mines that operated in the district this season were successful by the use of portable screening and washing machines, with steam shovels and drag line scrapers.

**Park County**—This county has shown more activity in 1930 than for some time past. Eighteen mines were operated during the year. It is known for its production of high grade smelter ore.

The London mine, operated by the London Gold Mines Co., S. G. Gateley, General Superintendent, has a record of having produced high grade smelter ore for over 40 years, and is still producing at a depth of 2,000 feet and deeper, showing values as good, if not better, than near the surface. There is every indication it will continue to produce for years to come.

The America, Weber, Champaign, Buckskin, Hock Hocking, Great West and Sweet Home mines have been carrying on development work during the year which has developed new ore bodies, most of them in virgin territory. A number of prospectors in the Alma district have met with success.

**Routt County**—The Hahns Peak mining district is among the oldest in the state. The Royal Flush, Master Key, Tom Thum and Copper King mines carried on development work during the year. This developed new ore bodies, most of which are in virgin

ground. There is a large area near the old town of Hahns Peak, which contains deposits of rich placer gold. This ground will stand investigation and deserves more attention than it has received.

**Summit County**—This county was harder hit than any other in my district by the slump in metal prices, as most of the mines were producers of complex ores. Twenty metal mines and four placers were operated during the year.

The Royal Tiger Mines Co., John A. Traylor, Manager, operating the Tiger mine and mill, after remodeling their mill, resumed operations on the gold ore from their Cashier mine, milling 100 tons daily, while operating, with good results. The ore developed assures operations for years to come.

The Jumbo, Dunkin, Bullion, Hunkidory, Roberts Tunnel, Pilot and Etta M. mines have been doing development work during the past year, and this work has shown a large available tonnage of complex ores.

The placers that operated were the Blue River dredge, Washington, Bemrose and McNulty, all of which had good results. For six miles along the Blue River above Breckenridge is a territory that contains very rich deposits of placer gold worthy of investigation.

### **DISTRICT NO. 2, by Herrick McLeod**

**Custer County**—The metal mining industry was at a standstill in this county during the year 1930, on account of the low price of silver and lead. A small force of men is employed at the Terrible mine at Ilse, keeping the water out until arrangements are made to reopen the mine for production.

Under favorable market conditions a large tonnage of silver-lead ores could be produced in the Terrible, Bull Domingo, Geyser, Racine Boy, Maverick, Pocahontas, Humboldt and other mines within a few miles of Silver Cliff. Plans are being made to operate some of these mines in 1931.

Some prospecting has been done in a search for gold-bearing ore. In the Ophir Creek section, Charles Akin is driving a tunnel to explore a group of claims at a depth of 400 feet. These claims show promising gold values on the surface.

**Douglas County**—A large production of fire clay, plastic clay, silica, and limestone was made in this county during 1930.

**El Paso County**—One limestone quarry, one lime kiln plant, one clay mine, a sandstone quarry, and the ore-reduction plant of the Golden Cycle Corporation were in operation in this county. The product of the sandstone quarry in Ute Pass is shipped to Texas.

The ore-reduction plant of the Golden Cycle Corporation, known as the Golden Cycle mill, treats all the ores produced in the Cripple Creek mining district. The records of the mill show that over 300,000 tons of ore were treated in 1930. This mill is a convenient market for Cripple Creek ores, with low freight and treatment rates.

**Fremont County**—The production of fire clay, silica, gypsum, mica, feldspar, limestone, travertine, marble, and building and monumental granite are important industries in this county.

The plant of the Colorado Portland Cement Company was in operation for ten months of this year. During the shut-down in November and December the men were employed half time overhauling the plant. Full operations will be resumed at the plant on Jan. 5, 1931.

The Diamond Fire Brick Company operated its quarries and brick plant continuously during the year. This plant has a capacity of 15,000 to 20,000 bricks a day.

The granite quarries near Cotopaxi are producing most of the granite used in the building of the new City Hall in Denver.

Development work has been carried on steadily in several sections of this county, which will lead to an increased production of feldspar, fluorspar and mica. Robert Shipley is developing a feldspar mine in Eight Mile Park. L. D. Miller is developing an immense vein of feldspar, twenty miles west of Canon City. E. E. Zingheim is opening a deposit of mica and a vein of feldspar, five and one-half miles from Echo. He has exposed a body of beryl crystals, some of which are over a foot in diameter and from four to six feet in length. These crystals carry a high percentage of beryllium. J. T. Stroehle and associates are sinking a shaft on a vein of fluorspar located near Cotopaxi.

**Huerfano County**—There is one limestone quarry and one clay mine in this county. They produce a large tonnage which is shipped to the Standard Fire Brick Company of Pueblo.

**Las Animas County**—There is a shale pit and a brick plant in this county. The brick plant has a capacity of 15,000 to 20,000 bricks per day.

**Otero County**—This county has one brick plant, one clay pit and one shale pit. The brick plant has a capacity of 20,000 bricks per day.

**Pueblo County**—Pueblo county has one limestone quarry, one sandstone quarry, six clay mines, one clay kiln plant, one clay grinding plant, one mica grinding plant and two brick plants.

The Standard Fire Brick Company's plant has a capacity of 60,000 bricks per day.

The Summit Pressed Brick and Tile Company's plant has a capacity of 20,000 bricks per day.

**Teller County**—Cripple Creek and vicinity is a great gold-producing district. The experience of the past year has proved that it is self-sustaining. Very little outside money has been used in development work as compared with the total amount expended. Volumes could be written about the opportunities and advantages for mining in this district. The climate is favorable for all-year work. Transportation and treatment facilities are good. There are many acres of undeveloped ground within the limits of the producing area. Many properties, which produced fortunes from surface workings, have lain idle for over twenty years. It is reasonable to presume that these properties could be worked at a profit with the low treatment and freight rates now available.

The Cresson mine, owned by The Cresson Consolidated Gold Mining and Milling Company, L. G. Carlton, General Manager, A. H. Bebee, Superintendent, is making a production of 6,000 tons a month. This mine has paid \$12,332,472.52 in dividends. It now pays a dividend of a cent a share, or \$12,200 quarterly. A large amount of development work has been done during the year, and new ore bodies have been opened on various levels, those on the 12th and 13th being the most profitable. The most important work being done at present is the development of a body of ore which lies in the west part of the mine between the 14th and 15th levels. A few months ago the upper ten levels were opened to lessees. There are now nineteen sets of leasers operating on these levels, nearly all of them producing ore. For the convenience of the leasers the company has found it necessary to enlarge the ore house. An increase in tonnage is expected during the coming year.

The Portland mine, Clayton Kissell, Superintendent, produces 2,500 tons a month. There are forty-two sets of leasers on this property. The Portland Gold Mining Company has also done a large amount of development work during the past year.



The Granite Gold Mining Company, Henry Christensen, Superintendent, is operating its property through the Ajax and Gold Coin shafts. It is making a production of 1,200 tons a month, with an average value of \$25.00 per ton. On this well-managed mine development work is constantly going ahead while production is maintained. Mr. Christensen predicts an increased output in 1931.

The United Gold Mines Company—This company owns a large acreage which includes the Bonanza, Golden Cycle group, Vindicator group, Fairview, Rose Nicol, Patti Rosa, Big Banta, Trail, W. P. H., Damon and others. Under the able management of L. G. Carlton and his corps of superintendents, a large program of development work is carried out each year, and such old mines as the Golden Cycle group and the Vindicator group, which were considered years ago to be worked out, are operated year after year at a profit. During the last year about 12,000 feet of development work has been done on the various properties of the company. At the present time two ore chutes are being taken out from the 6th and 8th levels of the Vindicator, and an ore chute, which is not large but of high grade, is being worked on the Trail claim.

There are numerous sets of lessees working through the different properties. Some of these lessees have mined very good ore during the last year, one in particular being the Swaboda lease on the Patti Rosa claim.

The total production from the various U. G. M. properties is approximately 7,000 tons per month. The company has paid one dividend of \$50,000 this year, and has cash assets as of October 31st, 1930, of \$152,404.96.

The Le Claire Mines Company—There are 167 acres in the Le Claire property, 95 acres in the Queen, and 35 acres in the Logan tract, which are all under the management of John Tait Milliken. At present there are six sets of leasers working on the Le Claire property, who make a production of about 700 tons a month.

Mr. Milliken has great faith in the Cripple Creek district, and has made arrangements to do extensive work on these properties. He intends to begin operations at an early date.

The Mexican Gold and Silver Mining Company, Ed Lindsay, Superintendent, has done a large amount of work on the Pinnacle property during the last year. The Mitchell shaft was sunk 100 feet from the seventh to the eighth level, which is 635 feet from the surface. Drifts were driven north and south and encountered

ore on both sides of the shaft. The north drift was driven in ore for 115 feet. This ore gave returns of \$35.00 to \$65.00 per ton in carload lots. A crosscut has been started at the sixth level, which is 435 feet from the surface, and will be driven 1,200 feet or more to explore the west and southwest sections of the property where large bodies of rich ore were found near the surface in early days.

The Stratton Estate has fifteen sets of leasers who make a production of about 800 tons a month. A lease was taken on the Moon Anchor recently by Henry La Chapelle, Sr., John Anderson, and Henry La Chapelle, Jr. The property is now owned by the Stratton Estate. It has not been worked for twenty-two years. The lessees have built a shaft house and are retimbering the shaft and installing machinery. They will be working underground by the first of the year.

The Stratton Estate has many blocks of good ground lying idle which are open for leasing.

The property of the Strong Gold Mining Company is being worked by the Strong Lease, Fred Jones, Superintendent. Shipments at present run about 250 tons a month.

Block 8, School Section, is under operation by the Fanny Fern Mines, Incorporated, with W. A. Kyner, Superintendent. Ore shipments are being made which have a value of \$30.00 to \$50.00 a ton. The shipments at present amount to 150 tons a month. The prospect is good for a greatly increased production in 1931.

The Consolidated Extension Mines Company has opened up the C. O. D. mine in Poverty Gulch. This work is under the supervision of E. P. Arthur, Jr., who is one of the owners. An electric hoist and five-drill compressor have been installed. Ore has been found on several levels and shipments will be made soon.

The Golden Rod Mining and Milling Company. John E. Dempsey, Manager and Treasurer, is operating the Sangre De Cristo property. Considerable development work has been done and several shipments of good ore have been made. One carload contained values of over \$80.00 a ton.

Among the properties on which work will be resumed within the next few weeks are the Isabella, which will be operated by L. G. Carlton; the Anchoria Leland by The Montreal and Colorado Gold Mining Corporation, E. B. Birdsall, Superintendent, and the Index property by Fanny Fern Mines, Incorporated, E. B. Birdsall, Superintendent.

Over 1,200 tons of dump rock have been shipped from the Anchoria Leland to the Golden Cycle since last April.



Large tonnages have been shipped during the year from the Elkton, Elizabeth Cooper, Findley and many smaller dumps.

To dispel the idea that there is no more high grade ore to be found in Cripple Creek mines, here is the record of a recent shipment from a lease in the Golden Cycle group, Legal Tender claim:

374 lbs.....	Value \$7,600.00 a ton
4,940 lbs.....	Value 1,800.00 a ton
20,000 lbs.....	Value 600.00 a ton

### DISTRICT NO. 3, by R. J. Murray

**Lake County**—Some new ore bodies have been developed in the Deep Mines operations during the past year. Their production has been kept up to 6,500 tons monthly.

Developments in the Ibex resulted in several new finds of high grade ore.

The Star and Porter properties, with Mr. Cramer as manager, have produced approximately 40 tons daily of lead-carbonate and iron ores during the past year.

The Resurrection is one of the fortunate properties operating during the past year. One of a number of diamond drill holes on this property went through some 60 feet or more of very good grade of sulphide ore. This is in virgin country. Development work is now being pushed to reach this ore and to start production.

The Nicholson lease on the Adams property has been a persistent shipper of ore to the zinc plant during the past year.

The Climax Molybdenum Company has been mining and milling between 1,200 and 1,600 tons daily throughout the past year, and has found a ready market for its product.

**Eagle County**—The Empire Zinc Company has been a persistent producer, especially since the new underground mill began operations. A combined tonnage of 1,200 tons daily is being shipped and milled at this property.

The Liberty mine has reopened, and the unwatering of the incline is under way at this time. 300 feet of additional sinking is to be done. When this is completed the incline will be 910 feet deep. A station will be cut and vigorous development pushed from this level. Ores have been discovered at this point by diamond drill holes.

**Pitkin County**—The Midnight mine and new mill comprise developments in Aspen during the past year. This mill should be running on at least a fifty-ton basis before the new year.

A small amount of new work was started on the old Independence group during the past summer. Some new ores have been found and are said to contain fair gold values.

**Mineral County**—The fluorspar mine at Wagon Wheel Gap is turning out a steady tonnage of fluorspar concentrates and crude for the company's plant at Pueblo.

The Amethyst and Commodore properties were the main producers in the Creede district during the past year. A small amount of new work is being carried on at the Happy Thought. Due to the price of silver the first two mentioned properties have suspended operations temporarily until the recovery of the metal market.

Large quantities of lead could be mined profitably were the operators given a chance to have their lead ore treated at some available metallurgical plant in the state.

**Garfield County**—The United States Vanadium property is producing approximately 150 tons of vanadium ores for the mill at Rifle.

The Grand View mine, located at Rifle, has built a mill and is doing a small amount of mining at this time.

**Rio Grande County**—The Little Annie mine, under the management of Jack Pickens, has worked during the past year with a very small force of men, and has produced only a small amount of gold ore.

**Saguache County**—The blow to Saguache County during the past year was the closing down of the Rawley mine. The Orient mine in this county has reopened after an idleness of several months, and is now producing 250 tons of hematite iron ore daily.

**Conejos County**—Some new work has been carried on in this county during the past few months, and consists of sampling a blowout said to contain low grade gold values with some thirty million tons exposed.

**Gunnison County**—A small amount of new work was carried on near Marble during the past summer. Some ores were said to have been found, and the coming year will see some activity in that district.

**Chaffee County**—While the mines of Chaffee County have not been very active during the past year, or for some time past, many mines are known to contain large quantities of low grade

ores, and will likely become active once they have been given a chance to market their product with the restoration of normal metal market prices. The Burton quarry is producing 750 tons daily of lime rock for the Colorado Fuel and Iron Company. The granite quarries are all active in this county and are finding a ready market for their products.

#### **DISTRICT NO. 4, by J. F. Clougher**

The magnitude of underground developments at present under active headway, the new mining projects undertaken, the marked investigations of the general "San Juan" district during 1930, and the large scale operations planned for 1931 leave but scant room for discounting a very noticeable increase of mining activities for many years hence, in this district.

**Archuleta County**, a large portion of which was for many years closed to prospectors, has been given study and exploration during the past two years, especially with reference to the large porphyry dikes carrying values in gold. No extensive development has been done to determine the extent of ore depositions, but conditions in this section appear favorable for mining operations on a good-sized scale. The Copper Queen group was the most actively operated property during 1930.

**Dolores County** had seven different mining properties in active operation during the fore part of the present year, and in the month of October there was started on the Rico-Wellington property the driving of a large operating tunnel calculated to be one mile in length, and the sinking of a large winze of an estimated depth of 1,200 feet. In conformity with well prepared plans and arrangements this big underground development will be conducted without cessation until completed.

**Gunnison County** activities during this year include the operations of nine different mining properties, on all of which an increase of operations and considerable new improvements are planned for 1931. Besides the properties in active operation, quite a few old mines were reopened, some of which have ore exposures sufficient to justify the inauguration of added developments and operations in this county next year. A variety of deposits are found in this large mineralized section.

**Hinsdale County** operations consisted chiefly in underground development on the Empire Chief, Highland Chief, Edna-Jack Pot, Goleonda and Silver Jack mines, and the installation of mill machinery and equipment on the Silver Jack and the Ute and Ulay

properties. Of much importance to this section is the extension of the Chicago tunnel on which work will be prosecuted until reaching a certain objective that is quite a considerable distance ahead, thereby not only affording deep development of the immediate area, but also providing economical transportation facilities for adjacent and contiguous mining properties.

In **La Plata County** the major operations during this year have been on the Gold King and May Day mines. Exploratory work on the Gold King property has resulted in stimulating the decision by the present management to do extensive underground development during the coming year. In this section there was more demand for leases and more prospecting during 1930 than for many years past, due in all probability to the fact that ores with unusually high values in gold and silver have been found in this particular area.

In **Montezuma County** operations during the present year were conducted on the Doyle group and associated properties situated on the East Mancos river. The nature of the work performed was in a great measure preparatory for the mining and milling of ore bodies with gold values exposed on these properties. Also, in this county near the head of the West Mancos river, is a group of claims on which some underground development was performed by a small working force, and a small concentration and flotation mill erected on said property this year. Plans have been made for good-sized operations on both of these projects during next year.

**Montrose County** carnotite fields received considerable attention during 1930. A force of from 125 to 150 men was employed during the greater part of the year in the opening and development of carnotite deposits, and in the erection of a modern plant for the treatment of said ore, which necessitated an outlay of over \$400,000. Much activity in the production and milling of this ore is anticipated in this particular vicinity for the coming year.

In **Ouray County** mining and milling operations have been conducted on nine different properties during this year. Large scale developments planned for next year comprise considerable extensions of the underground workings of the Independent group and the erection of a modern concentration and flotation mill on said property. The Camp Bird mine led all other properties in this county in the production of ore this year. There is reasonable assurance that one or two new projects will be under



active headway early next season, with sufficiently strong financial support to operate in a big way.

**San Juan County** activities during most of the present year afforded employment to 650 men daily on nine different mining properties. The principal producers during this year are the Sunnyside, Shenandoah-Dives, Iowa, Buffalo Boy, Little Nation and Garryowen mines. Minor scale operations by individual owners and lessees were carried on with from 2 to 3 men on six other mining properties in different parts of this county, making a total of fifteen under active headway during this year. Continued underground exploration and development of the big mines of this section has demonstrated the existence of ore bodies far in excess of any heretofore encountered both as to tonnage and values.

**San Miguel County** has had six different mining properties under active operations during 1930. The leading producer in this section this year is the Carbonero mine. At the present time there is under serious consideration the acquisition of an immense area comprising several large meritorious groups of mining claims, with very reasonable assurance that the deal now pending will be satisfactorily consummated in the early part of the coming year. Irrespective of the records of heavy production by the mines of this county for the past 40 years, the vastness of the unexplored tracts in this section offer opportunities to greatly surpass in output and value the former splendid record of this ore-producing county.

## NONMETALLIC MINES

The operation of nonmetallic mines and quarries during the past few years in Colorado has developed into one of the state's most important industries. Any demand for building or monumental stone of every kind, such as granite, marble, onyx and so on, can be fully supplied from their stupendous stores in various parts of the state. Many quarries have been opened along the eastern mountains, the Arkansas and Platte rivers, in Gunnison, Pitkin and in other counties of the western slope. Building sands and gravels are found in abundance along all rivers and streams.

The clay deposits of Colorado for all purposes are unexcelled. It is highly improbable that any desired industrial clay could not be found within the state's confines. Feldspar, fluor-spar, bentonite, sillimanite, lime, gypsum and the like are found in large quantities. Enormous oil shale deposits, also bitumen, asphalt and tar sands exist in several of the western counties. Mica, jefferisite, muscovite and other insulating materials are widely distributed throughout the state.

During the past year 80 quarries and pits were in active operation in Colorado, as shown in the appended table of "Operating Quarries and Clay Pits for 1930." They produced upwards of \$1,125,000 and gave employment to hundreds of men.

The name, location and character of products of the various quarries and pits appear in this report under the heading "Operating Quarries and Clay Pits" and more detailed mention in the "Review of the Mining Districts" by the state mine inspectors.



## HISTORICAL NOTE

The Bureau of Mines of the State of Colorado was established by an act of the Tenth General Assembly, approved March 30, 1895. This act repealed a previous act creating an "Inspector of Metalliferous Mines," which was passed in 1889. The Bureau of Mines law established the office of Commissioner of Mines, provided for in the State Constitution, and charged him, among other things, with the supervision of metal mine inspection and the enforcement of laws relating to safety and health in metal mines. Subsequently this was broadened to include "any ore mill, sampling works, smelter, metallurgical plant, rock quarry, clay pit, railroad tunnel, rock excavation or mine of whatsoever kind or character, except coal mines." The Commissioner of Mines was also charged, "as he has opportunity and means," to collect mineral specimens and exhibit the same, to collect books relating to mining and geology, to collect and preserve data regarding mining methods, mining costs, milling, metallurgy, geology, mineral deposits of all kinds, and so on. Aside from the purchase of the Elsner collection of minerals, very little "opportunity and means" has been granted to the Commissioners for anything except inspection work. The present activities of the Bureau of Mines are treated elsewhere in this report.

## COMMISSIONERS OF MINES

Harry A. Lee.....	May 11, 1895-May 10, 1903
E. L. White.....	May 10, 1903-May 10, 1907
T. J. Dalzell.....	May 10, 1907-May 10, 1911
T. R. Henahen.....	May 10, 1911-May 10, 1915
Fred Carroll.....	May 10, 1915-June 1, 1919
Horace F. Lunt.....	June 1, 1919-June 1, 1923
John T. Joyce.....	June 1, 1923-June 1, 1927
John T. Joyce.....	June 1, 1927-

## PUBLICATIONS OF THE BUREAU OF MINES

### BULLETINS

- Bulletin No. 1, Recommendations for Safety Appliance in Mining, Harry A. Lee, Commissioner of Mines, 1896.
- Bulletin No. 2, Precious Metal Production for the year 1898, Harry A. Lee, Commissioner of Mines, 1899.
- Bulletin No. 3, Mining Laws, Relative to Bureau of Mines Precious Metal Production, Harry A. Lee, Commissioner of Mines, 1899.
- Bulletin No. 4, Precious Metal Production, Harry A. Lee, Commissioner of Mines, 1901.
- Bulletin No. 5, Precious Metal Production, Harry A. Lee, Commissioner of Mines, 1902.
- Bulletin No. 6, Regulations Relative to the Construction, Equipment and Operation of Metalliferous Mines, Mills and Metallurgical Plants, Recommendations and Mineral Production for 1905, E. L. White, Commissioner of Mines, 1906.
- Bulletin No. 7, Federal and State Laws Relating to Mining, Fred Carroll, Commissioner of Mines, 1916.
- Supplement to Bulletin 7, Mining Laws Enacted by the Twenty-first General Assembly, Fred Carroll, Commissioner of Mines, 1917.
- Supplement No. 2 to Bulletin No. 7, Amendments to the Mining Laws Enacted by the Twenty-second General Assembly, Horace F. Lunt, Commissioner of Mines, 1919.
- Supplement No. 3 to Bulletin 7, Amendments to Laws Relating to Mining Enacted by the Twenty-third General Assembly, Horace F. Lunt, Commissioner of Mines, 1921.
- Supplement No. 4 to Bulletin 7, Amendments to Laws, Relating to Mining Enacted by the Twenty-fourth General Assembly, Horace F. Lunt, Commissioner of Mines, 1923.
- Bulletin No. 8, The Oil Shales of Northwestern Colorado, Horace F. Lunt, Commissioner of Mines, 1919.
- Bulletin No. 9, Mine Safety Standards, Horace F. Lunt, Commissioner of Mines, 1920.

### REPORTS

- Report of Bureau of Mines, Colorado, from its establishment in May, 1895, to November 30, 1896, Harry A. Lee, Commissioner of Mines, 1896.

- Report for the Year 1897, Harry A. Lee, Commissioner of Mines, 1898.
- Report for the year 1898, Harry A. Lee, Commissioner of Mines, 1899.
- Biennial Report for the Years 1899-1900, Harry A. Lee, Commissioner of Mines, 1900.
- Biennial Report for the Years 1901-1902, Harry A. Lee, Commissioner of Mines, 1903.
- Biennial Report for the Years 1903-1904, E. L. White, Commissioner of Mines, 1905.
- Biennial Report for the Years 1905-1906, E. L. White, Commissioner of Mines, 1907.
- Biennial Report for the Years 1907-1908, T. J. Dalzell, Commissioner of Mines, 1909.
- Biennial Report for the Years 1909-1910, T. J. Dalzell, Commissioner of Mines, 1911.
- Biennial Report for the Years 1911-1912, T. R. Henahen, Commissioner of Mines, 1913.
- Biennial Report for the Years 1913-1914, T. R. Henahen, Commissioner of Mines, 1914.
- Biennial Report for the Years 1915-1916, Fred Carroll, Commissioner of Mines, 1916.
- Biennial Report for the Years 1917-1918, Fred Carroll, Commissioner of Mines, 1919.
- Annual Report for the Year 1919, Horace F. Lunt, Commissioner of Mines, 1920.
- Annual Report for the Year 1920, Horace F. Lunt, Commissioner of Mines, 1921.
- Annual Report for the Year 1921, Horace F. Lunt, Commissioner of Mines, 1922.
- Annual Report for the Year 1922, Horace F. Lunt, Commissioner of Mines, 1923.
- Annual Report for the Year 1923, John T. Joyce, Commissioner of Mines, 1924.
- Annual Report for the Year 1924, John T. Joyce, Commissioner of Mines, 1925.
- Annual Report for the Year 1925 was fully prepared but because of lack of funds was not printed. The manuscript is on file in the office of the State Bureau of Mines.
- Annual Report for the Year 1926, John T. Joyce, Commissioner of Mines, 1927.

Annual Report for the Year 1927, John T. Joyce, Commissioner of Mines, 1928.

Annual Report for the Year 1928, John T. Joyce, Commissioner of Mines, 1929.

Annual Report for the Year 1929, John T. Joyce, Commissioner of Mines, 1930.

At the time this report goes to press, there are available for distribution copies of the Annual Reports for 1921, 1922, 1923, 1926, 1928 and 1929, Bulletins 7, 8 and 9. The price of Bulletin 7, with supplements, is 50 cents, all other available publications are free. The publications not mentioned in this paragraph are exhausted, but copies may be found in many of the public, state and college libraries throughout the country.

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Note—The Colorado Geological Survey has published a number of geological reports and maps, a list of which may be obtained from Dr. R. D. George, Head Geology Department, University of Colorado, Boulder, Colorado.

## PRODUCTION

### Gold, Silver, Copper, Lead and Zinc.

The total production of gold, silver, copper, lead and zinc from the mines of Colorado for the calendar year ending December 31, 1930, amounted to \$13,129,693, divided among the various mining counties as shown by the tabulation thereof inserted in said Table No. 1 in this report. The six leading counties in value were San Juan first, Eagle second, Teller third, Lake fourth, Park fifth, and Saguache sixth.

Counties which produced \$100,000 or more in any of the aforesaid metals, apart from all others, are given below and classified in the order of their monetary value:

Gold: Teller, San Juan, Park, Summit, Ouray, Gilpin, Eagle and Clear Creek; silver, Eagle, San Juan, Lake, Mineral, Saguache; copper, Eagle, San Juan, Saguache; lead, San Juan, Lake, Eagle, Saguache; zinc, Eagle, Lake, San Juan.

### Miscellaneous.

The United States Vanadium Corporation of New York operated their mine and plant at Rifle steadily throughout the year, producing 618 tons of 87.3 per cent vanadium concentrates from 51,594 tons of crude ore. This is one of the largest enterprises of its kind in the world.

The Climax Molybdenum Company of New York is operating what is now acknowledged to be the largest deposit of molybdenum ore in the world. From its operations last year they produced 3,083,000 pounds of 100 per cent molybdenum from 414,449 tons of crude ore. Upwards of 50,000,000 tons of molybdenum ore has been developed on the company's properties by systematic diamond drilling.

### Acknowledgment.

Thanks are due to Scott Turner, director, and C. W. Henderson, engineer, of the United States Bureau of Mines, for the production statistics regarding the common metals.



## Colorado Mineral Production U. S. Bureau of Mines Since 1859

	1859-1929	1930
Gold .....	\$ 710,691,000	\$ 4,516,196
Silver .....	516,729,000	1,651,876
Copper .....	44,993,000	1,213,588
Lead .....	215,236,000	2,321,592
Zinc .....	151,673,000	3,426,441
Coal .....	700,754,000	20,490,000
Tungsten .....	19,450,000	75,000
Radium .....	18,000,000	.....
Petroleum .....	28,120,000	1,242,257
Molybdenum .....	10,793,000	2,500,000
Vanadium .....	6,287,000	618,537
Fluorspar .....	1,938,000	115,000
Iron .....	3,872,000	44,000
Manganese .....	4,095,000	112,000
	<hr/>	<hr/>
	\$2,432,631,000	\$38,326,487
Grand Total .....		<hr/> \$2,470,957,487



TABLE I

PRODUCTION OF THE PRINCIPAL METALS IN COLORADO IN 1929 AND 1930<sup>1</sup>

County	GOLD <sup>2</sup>		SILVER <sup>2</sup>		COPPER		LEAD		ZINC		TOTAL VALUE		Increase or Decrease													
	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930														
	Fine Ounces	Value	Fine Ounces	Value	Fine Ounces	Value	Pounds	Value	Pounds	Value	Pounds	Value														
Adams .....	197	\$ 4,072	254	\$ 5,251	26	\$ 16	17	\$ 6	....	....	....	....	....	....	....	....	....	....	....	....	\$ 4,088	\$ 5,267	+	\$ 1,169	Adams	
Boulder .....	1,622	38,528	779	16,103	7,652	4,185	4,472	1,722	....	....	....	....	35,921	\$ 3,363	11,000	\$ 572	....	....	....	....	39,976	18,397	—	21,579	Boulder	
Chaffee .....	17.65	269	12	269	1,366	728	1,290	497	6,597	\$ 1,161	....	....	64,778	3,451	44,000	2,288	....	....	....	....	5,709	3,054	—	2,655	Chaffee	
Clear Creek.....	4,499.9	93,012	5,137	106,191	168,550	89,997	38,350	13,995	41,472	7,299	24,000	\$ 2,976	526,397	33,153	143,000	7,436	66,000	\$ 3,696	20,000	\$ 940	237,168	131,538	—	95,630	Clear Creek	
Costilla .....	4.68	101	....	....	11	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	107	....	—	107	Costilla	
Custer .....	....	....	....	....	1,835	978	....	....	....	....	....	....	22,626	1,438	....	....	....	....	....	....	2,416	....	—	2,416	Custer	
Denver .....	5.56	115	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	116	....	—	115	Denver	
Dolores .....	622.44	12,866	284	7,936	272,985	145,501	64,111	34,683	337,360	57,596	200,000	24,600	7,060,047	444,783	1,046,000	54,392	5,905,000	389,730	977,000	45,819	1,050,476	157,732	—	892,744	Dolores	
Eagle .....	3,483	71,995	5,676	115,266	917,171	488,852	1,541,706	593,557	3,139,000	552,464	6,310,000	658,440	895,000	24,685	7,735,000	402,230	840,000	55,440	28,410,000	1,335,270	1,193,636	3,104,753	+	1,911,117	Eagle	
Ourfield .....	....	....	....	....	....	....	63	13	....	....	....	....	....	....	16,000	832	....	....	....	....	....	846	....	+	845	Garfield
Gilpin .....	5,287.32	109,289	6,167	127,483	28,912	15,410	18,685	7,194	108,420	19,082	69,000	3,556	120,904	7,617	57,000	2,954	....	....	....	....	151,898	145,197	—	5,201	Gilpin	
Gunnison .....	396.51	8,196	691	18,419	12,405	6,612	2,412	929	12,761	2,346	....	....	164,931	10,390	76,000	3,952	300,000	13,200	206,000	9,682	40,644	32,982	—	7,662	Gunnison	
Hinsdale .....	34.59	715	7	145	3,165	1,687	127	49	2,722	479	....	....	92,906	5,853	19,000	988	42,000	2,773	....	....	11,506	1,182	—	10,324	Hinsdale	
Lake .....	6,677.8	138,031	3,638	79,339	394,270	210,146	616,782	337,451	317,096	66,809	254,000	31,496	10,343,286	651,627	13,718,000	661,336	25,828,000	1,770,648	23,112,000	1,086,264	2,826,261	2,095,896	—	730,365	Lake	
La Plata.....	5,629.4	116,360	285	5,891	63,107	44,396	2,737	1,054	....	....	....	....	71,000	4,478	....	....	....	....	....	....	165,129	6,945	—	153,184	La Plata	
Mineral .....	121.77	2,517	129	2,667	612,497	326,461	404,767	155,835	....	....	....	....	271,000	17,073	139,000	7,238	....	....	....	....	345,051	105,730	—	180,321	Mineral	
Moffat .....	6.61	116	....	....	75	40	....	....	17,000	2,993	....	....	....	....	....	....	....	....	....	....	3,148	....	—	3,148	Moffat	
Montezuma .....	7.3	151	78	1,612	....	....	35	10	....	....	....	....	....	....	....	....	....	....	....	....	151	1,622	+	1,471	Montezuma	
Montrose .....	....	....	3	41	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	41	....	+	41	Montrose
Ouray .....	17,832.51	368,598	7,175	148,320	20,683	11,024	21,219	8,169	53,171	9,358	24,000	2,976	102,824	6,478	163,000	8,476	....	....	....	....	395,458	167,941	—	327,517	Ouray	
Park .....	10,004.6	206,797	23,912	494,305	8,953	4,772	11,736	4,518	1,693	298	7,000	868	148,205	9,337	304,000	15,808	....	....	....	....	221,204	515,499	+	294,295	Park	
Pitkin .....	2.99	62	4	82	98,680	62,703	56,207	21,640	....	....	....	....	1,420,826	69,512	741,000	38,632	202,000	13,332	47,000	2,209	155,609	62,464	—	93,145	Pitkin	
Rio Grande.....	1,634.3	83,782	286	7,979	6,058	6,239	239	92	5,392	949	....	....	55,237	3,480	....	....	....	....	....	....	41,440	8,071	—	33,369	Rio Grande	
Saguache .....	1,016	21,043	505	10,439	722,319	384,996	328,040	126,295	2,667,000	469,392	1,200,000	143,800	5,806,000	355,778	2,238,000	116,376	....	....	....	....	1,241,209	401,910	—	839,299	Saguache	
San Juan.....	20,671	431,404	31,848	658,357	871,544	464,533	1,085,511	417,960	2,157,000	379,632	2,668,000	330,833	19,012,224	1,197,770	17,532,000	916,864	22,858,000	1,508,625	20,131,000	946,157	3,981,967	3,270,170	—	711,797	San Juan	
San Miguel .....	3,636.46	75,207	1,694	35,018	127,553	68,039	31,837	31,503	35,367	6,207	81,000	3,844	2,448,317	154,244	1,512,000	78,524	....	....	....	....	303,697	148,989	—	154,708	San Miguel	
Summit .....	2,370.4	48,996	7,179	148,403	27,514	14,665	3,345	1,288	13,233	2,329	....	....	737,286	46,449	52,000	2,704	1,930,000	127,380	....	....	239,819	152,395	—	87,424	Summit	
Teller .....	127,722.98	2,640,034	122,228	2,536,677	9,344	4,927	8,847	3,406	....	....	....	....	....	....	....	....	....	....	....	....	2,644,961	2,530,083	—	114,878	Teller	
Total .....	213,706.17	\$4,417,658	318,471	\$4,516,196	4,397,377	\$2,243,802	4,390,587	\$1,651,876	8,905,074	\$1,567,293	9,767,000	\$1,213,588	48,889,906	\$3,060,064	44,646,000	\$2,231,592	58,861,000	\$3,884,926	72,903,000	\$3,426,441	\$15,293,343	\$13,129,693	—	\$2,163,650		

<sup>1</sup>Actual 11 months figures, with estimate for December.<sup>2</sup>Includes placer production.<sup>3</sup>Average value of metals: Gold, \$20.671835 per ounce; silver, \$0.385 per ounce; copper, \$0.124 per pound; lead, \$0.052 per pound; zinc, \$0.047 per pound.<sup>4</sup>Average value of metals: Gold, \$20.671835 per ounce; silver, \$0.533 per ounce; copper, \$0.176 per pound; lead, \$0.063 per pound; zinc, \$0.055 per pound.



## THE VALUE OF STATE INSPECTION IN LESSENING METAL MINE ACCIDENTS

By John T. Joyce

Life is the most precious of all man's possessions and the utmost effort on the part of the State, industry, and the individual is justified in the conservation of the lives and unimpaired well-being of the worker. The State of Colorado in 1908 recognized its responsibility for the safety of the mine worker by the enactment of statutes covering the establishment of a department to be known as the Bureau of Mines of the State of Colorado with a commissioner and inspectors and delegating to this department as one of its principal duties the examination of mines, mills, and quarries, as to safety and health conditions. This department has the power to order corrected, under penalty of heavy fine, dangerous conditions found.

By legislative act of 1911 the State was divided into 4 inspection districts for the purpose of rigid enforcement of accident prevention laws.

The Colorado Bureau of Mines, therefore, is vitally interested in the lessening of accidents in mines. Its inspectors examine into safety conditions at mines, mills, smelters, and quarries and make a diligent investigation of fatal and serious accidents and advise where possible means of preventing a repetition of such accidents. Reports on all mine, mill, smelter, and quarry accidents which are furnished by the operators to the State Industrial Commission, are studied and compiled for publication in the annual report of this Department. There were recently compiled in this department statistics on all metal mine accidents in Colorado for the present and past two eight-year periods, the summary of which is appended.

These figures demonstrate that the lessening of accidents in Colorado metal mines as in those of other states requires continued united effort on the part of mine operators and miners and continued inspection and guidance by an adequate force of state mine inspectors.

The value of state inspection in lessening mine accidents is difficult to enumerate in units only of dollars and cents and has a value to the industry and the public far greater than can be measured on a direct cost basis. We cannot usually say in any particular mine that a certain number of lives have been saved

by the righting of recognized dangerous conditions or by safer equipment and practices, but we do know that taking the state or country as a whole dangerous conditions, unsafe equipment, and unsafe practices in mines will each year take its toll of life and suffering and that the righting of such conditions and practices will inevitably save life. We know at the end of each year how many lives have been lost in our mines but we cannot definitely say how many lives have been saved by inspection service; that many lives are thus saved is self-evident, which is borne out by the figures mentioned. State inspection service results not only in the correction of dangerous conditions and practices but it also spurs the mine operator to increased thought and effort toward safety and the miner to increased carefulness. Both miner and operator are reminded by these inspectors that the state has a very definite interest in both the personal security of the miner and the continued successful operation of the mine. Also, the inspector through his visits to numerous mines and through information collected by the Department is able to suggest numerous measures which make toward safer and more economical mine operation.

Summarizing, a state mine inspection department is of very definite value in reducing accidents, promoting the safety and welfare of miner and operator, and in assisting in the successful operation of mines. A state mine inspection department can only operate with proper efficiency and success in reducing accidents if it has an adequate number of inspectors furnished with funds adequate for regular inspections and if it has the cordial and hearty support of the mine operator, the miner, and the public. The Colorado State Bureau of Mines pledges its continued effort toward the reduction of mine accidents and believes that in this most important work it will have, as it has always had from the Colorado mine operators, continued and even more hearty support from that highly important factor in the prosperity of our state.

### SUMMARY

Three 8-year periods on the basis of 100,000 shifts.

From 1906 to 1914, inc., 23,100,000 shifts were worked, 511 men were killed, ratio per 100,000 shifts.....	2.22
From 1915 to 1922, inc., 25,468,000 shifts were worked, 342 men were killed, ratio per 100,000 shifts.....	1.35
From 1923 to 1930, inc., 16,148,154 shifts were worked, 167 men were killed, ratio per 100,000 shifts.....	1.00



## FATAL ACCIDENTS

### Underground.

January 15, Frank Ash of Ouray, age 59, married, blacksmith and repair man, while employed at the Camp Bird mine, Ouray County, started down a manway after completing pipe work. On his way out of the mine he slipped off a ladder, falling 15 feet, and died from the effects of the injury February 11th.

February 17, E. L. Lerch, of Victor, age 34, single, mucker and trammer, employed at the School Section mine of the Kyner Leasing Company, was injured by fall of rock and died from his injuries March 30th.

June 7, Archie M. Wilson of Leadville, age 31, shift boss, employed at Climax mine of Climax Molybdenum Company, was crushed by fall of rock and died the following day.

June 7, Lorn Burton, of Butte, Montana, age 35, married, machineman, employed at Climax mine of Climax Molybdenum Company, was killed instantly by fall of rock.

June 7, Ralph Port, age 32, of Climax, married, a miner, employed at Climax mine of the Climax Molybdenum Company, was killed instantly by fall of rock.

June 7, Sherman Frazier, of Leadville, age 30, married, employed at Climax mine of the Climax Molybdenum Company, was killed instantly by fall of rock.

June 7, Fred Sidney McMahon, of Leadville, age 28, married, machineman, employed at Climax mine of the Climax Molybdenum Company, was killed instantly by fall of rock.

August 25, John G. Walker, of Leadville, age 49, married, a miner, employed at the Craven Walker lease on the Ibex mine at Leadville, fell headlong into a 45-foot winze or raise. He died from the effects of his injuries August 28th.

October 10, H. G. Hackler, of Redcliff, age 30, married, machineman, employed at the Eagle mine of the Empire Zinc Company at Gilman, was killed instantly by falling down chute, with run of ore.

October 26, Ray L. Shigley, of Victor, age 53, single, trammer, employed at the Cresson mine at Cripple Creek, was caught by running muck while standing on a plank between timbers.

The stull in front of him broke and let down the lagging dirt above it, killing him instantly. Violated the safety rules.

December 7, Antone Tehansik, of Leadville, age 63, married, a miner, employed in the Adams shaft of the Wolftone lease, Leadville, was injured by fall of rock and died the following day.

December 21, John Goodwin, of Breckenridge, age 41, widower, timberman, employed at the London mine, Alma, was killed instantly by fall of rock.

### **Shaft.**

February 18, Tony Dermic, of Gilman, age 43, married, trackman, employed at the Eagle mine of the Empire Zinc Company, Gilman, was riding a timber truck down an incline when the flange of the wheel struck a switch frog derailing the truck. Dermic was thrown off and the truck passed over his body. He died of his injuries February 21st.

October 14, William Gooch of Eureka, age 58, widower, master mechanic, employed at the Sunnyside mine, Eureka, while engaged in installing a water line in shaft, had his foot caught in a descending cage, death resulting the same day.

### **Surface.**

April 27, Louis M. Christiansen, of Naturita, age 46, married, machine setter, employed at the mill of the Rare Metals Corporation at Naturita, was injured when a jack supporting timber gave way, allowing a classifying machine to drop striking the employee, causing severe lacerations from the effects of which he died May 28th.

July 5, Edward W. Shimin, of Silverton, age 53, blacksmith, employed at the Iowa Tiger mine of Colorado-Mexico Mining Company, at Silverton, was instantly killed by falling from a tram bucket, while riding from the lower terminal to the mine. He was returning to work after a vacation and was accompanied by a woman, whom he was taking to the mine with him. Both appeared to be under the influence of liquor. In violation of the company's order in such cases and over the strong objection of the tram operator, he placed the woman in one bucket and he took the bucket immediately following some 200 or 300 feet behind the bucket in which the woman was riding. It is quite evident that in some unaccountable manner the woman loosened the clasp holding the bucket to the tension cable, allowing it to descend on the stationary cable with terrific force until it col-

lided with the bucket in which Shimin was riding. The collision knocked Shimin from the bucket and threw the woman's bucket from the tram, causing them both to fall a considerable distance to the ground, killing Shimin instantly and very seriously injuring the woman.

### **Smelter.**

July 30, Jasper Sandoval, of Durango, age 29, married, furnace man, employed at the Durango smelter of the American Smelting and Refining Company, was scalded by molten metal at the reverberatory furnace while tapping matte. He died from the effects of his injuries the following day.

### **Quarry.**

May 25, Abraham Joseph Huggard, age 56, married, driller, employed at the Bertrand Quarry, Golden, was killed by fall of rock, causing instant death. Carelessness on the part of the deceased.

May 25, Joseph Valdez, age 44, married, driller, employed at the Bertrand Quarry, Golden, was killed by fall of rock, causing instant death. Carelessness on the part of the deceased.

December 28, Paul Frattarelli, of Salida, age 35, married, driller and powder man, employed at quarry of George R. Rogers and Walter C. Wallen, was killed by a small piece of falling rock. The rock fell in such a way that the sharp end of it drove a hole through his skull.

### **Placer.**

November 21, Trevor B. Thomas, of Breckenridge, age 54, married, superintendent, employed at Blue River dredge of the Continental Dredging Company at Breckenridge, fell into the pond after the bank caved. He was getting out of the water when a second cave occurred, which knocked him back into the pond where he was drowned.

TABLE II

DAYS OF EMPLOYMENT IN AND ABOUT MINES, MILLS AND SMELTERS, AND NUMBER OF MEN  
KILLED AND INJURED PER 10,000 DAYS OF EMPLOYMENT DURING THE YEARS 1929 AND 1930.

	Employment Days of	Killed			Serious Injury (Time Lost Over 14 Days)			Slight Injury (Time Lost Under 14 Days)						
		1929			1930			1929			1930			
		No. of Acci- dents	Rate Per 10,000 Days	No. of Acci- dents	Rate Per 10,000 Days	No. of Acci- dents	Rate Per 10,000 Days	No. of Acci- dents	Rate Per 10,000 Days	No. of Acci- dents	Rate Per 10,000 Days			
	1929	1930												
Underground	1,136,432	760,494	18	.1583	14	.1840	117	1,029	189	2,485	905	7,963	374	4,917
Surface	327,352	228,838	3	.0916	2	.0873	35	1,069	49	2,141	150	4,582	73	3,190
Mills	360,219	286,837	1	.0277	..	....	31	.8605	7	.2440	234	6,496	27	.9413
Smelters	270,454	176,543	..	....	1	.0566	7	.2588	4	.2265	13	.4806	1	.0566
Quarries	264,068	197,326	1	.0378	3	.1520	22	.8331	43	.2179	139	5,263	118	5,979
Placer Mines and Dredges..	4,030	11,337	..	....	1	.8820	..	....	1	.8820	1	2,481	1	.8820





# CLASSIFICATION ACCORDING TO CAUSE OF ALL ACCIDENTS IN THE METAL MINING AND QUARRYING INDUSTRY IN THE STATE OF COLORADO DURING THE YEARS 1929 AND 1930—Continued.

	Fatal				Serious Injuries (Time lost over 14 days)				Slight Injuries (Time lost under 14 days)	
	1929		1930		Permanent Total Disability		Partial Disability		Temporary Disability	
					1929	1930	1929	1930	1929	1930
UNDERGROUND—Continued										
15. Other causes—										
(a) Falling objects other than 1 and 2.....	..	..	..	..	..	..	..	9	5	77
(b) Flying objects other than 2c.....	..	..	..	..	..	..	..	3	..	118
(c) Burns.....	..	..	..	..	..	..	..	26	36	25
(d) Miscellaneous.....	..	..	..	..	..	..	..	..	..	54
Total.....	17	12	..	..	2	3	108	178	..	363
SHAFT										
16. Falling down shaft.....	..	..	..	..	..	..	2	1	7	1
17. Objects falling down shaft.....	..	..	..	..	..	..	..	..	..	2
18. Breaking of cables.....	..	..	..	..	..	..	..	..	..	1
19. Overwinding.....	..	..	..	..	..	..	..	..	..	..
20. Cage, skip or bucket—										
(a) Runaway.....	..	..	..	..	..	..	..	..	..	..
(b) Riding with rock or ore.....	..	..	..	..	..	..	..	..	..	..
(c) Riding with timber or tools.....	1	..	..	..	..	..	..	1	..	..
(d) Struck by.....	..	1	..	..	..	..	..	2	4	..
21. Other causes.....	..	1	..	..	..	..	5	4	20	10
Total.....	1	2	..	..	..	..	7	8	31	11
SURFACE SHOPS AND PLANTS										
22. Haulage—										
(a) Hand and animal.....	..	..	..	..	..	..	2	1	2	3
(b) Mechanical.....	1	1	..	..	..	..	1	4	3	3
23. Railway cars and locomotives.....	..	..	..	..	..	..	..	..	..	2
24. Run or fall of ore in or from bins.....	..	..	..	..	..	..	..	..	..	..
25. Falls of persons.....	..	..	..	..	..	..	9	13	20	19
26. Nails and splinters.....	..	..	..	..	..	..	..	..	2	4
27. Hand tools, axes, bars, etc.....	..	..	..	..	..	..	2	2	10	13
28. Electricity—										
(a) Direct contact with trolley wire.....	..	..	..	..	..	..	1	..	..	2
(b) Tool or bar striking trolley wire.....	..	..	..	..	..	..	..	..	..	..
(c) Contact with motor.....	..	..	..	..	..	..	..	..	..	3
(d) Other causes.....	2	..	..	..	..	..	..	1	..	..
29. Machinery.....	..	..	..	..	..	..	..	..	..	4









TABLE IV

CLASSIFICATION ACCORDING TO CAUSE AND OCCUPATION OF THE FATAL ACCIDENTS THAT OCCURRED IN THE METAL MINING AND QUARRYING INDUSTRY OF COLORADO IN THE YEARS 1929 AND 1930.

MINES																
	Superintendent- men and Engineers		Machine Men and Helpers		Miners		Loaders, Shovelers, Muckers and Trammers		Trackmen, Pipemen, Pumpmen and Com- pressmen		Cage Tenders and Station Cagers		Carpenters, Timber- men and Helpers		Elec- tricians, Motor- men and Helpers	
	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930
UNDERGROUND																
1. Falls of rock or ore from roof or wall.....	..	1	2	..	2	5	2	2	2	..	..	..	..	1	1	..
2. Handling rock or ore.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3. Timber or hand tools.....	..	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..
4. Explosives .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5. Haulage .....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6. Persons falling down chute, winze, raise or stopes.....	2	..	..	..	2	1	..	..	..	..	..	..	..	..	..	1
7. Run of ore from chute or pocket .....	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..
8. Drilling (by machine or hand drills) .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9. Electricity .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10. Machinery other than 5 or 8.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11. Mine fires.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12. Suffocation from natural gases .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13. Inrush of water.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14. Nails and splinters.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15. Other causes.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals.....	3	1	4	1	5	6	3	2	..	..	..	..	1	1	..	1
SHAFTS																
16. Falling down shaft.....	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
17. Objects falling down shaft..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18. Breaking of cables.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19. Overwinding .....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
20. Cage, skip or bucket.....	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
21. Other causes.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals.....	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..

## SURFACE ACCIDENTS

	Superintendents and Foremen		Engineers, Firemen and Hoistmen		Blacksmiths and Mechanics		Carpenters and Topmen		Electricians		Others	
	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930	1929	1930
22. Haulage .....	..	..	..	..	..	..	..	..	..	..	1	..
23. Railway cars and locomotives.....	..	..	..	..	..	..	..	..	..	..	..	..
24. Run or fall of ore in or from ore bins.....	..	..	..	..	..	..	..	..	..	..	..	..
25. Falls of persons.....	..	..	..	..	..	..	..	..	..	..	..	..
26. Nails and splinters.....	..	..	..	..	..	..	..	..	..	..	..	..
27. Hand tools, axes, bars, etc.....	..	..	..	..	..	..	..	..	..	..	..	..
28. Electricity .....	1	..	..	..	..	..	..	..	..	..	1	..
29. Machinery .....	..	..	..	..	..	..	..	..	..	..	..	..
30. Other causes.....	..	..	..	..	..	..	..	..	..	..	..	..
Totals.....	1	..	..	..	..	2	..	..	..	..	2	..

## MILLS

CLASSIFICATION ACCORDING TO CAUSE AND OCCUPATION OF THE FATAL ACCIDENTS THAT  
OCCURRED IN THE METAL MINING AND QUARRYING INDUSTRY IN COLORADO  
IN THE YEARS 1929 AND 1930—Continued

SMELTERS										
	Superintendent- ents and Foremen			Laborers		Motormen and Switchmen		Furnace Men and Charge Wheelers		
	1929	1930		1929	1930	1929	1930	1929	1930	
1. Haulage system.....	..	..		..	..	..	..	..	..	
2. Railway cars and locomotives.....	..	..		..	..	..	..	..	..	
3. Cranes.....	..	..		..	..	..	..	..	..	
4. Other machinery.....	..	..		..	..	..	..	..	..	
5. Falls of persons.....	..	..		..	..	..	..	..	..	
6. Suffocation in ore bins.....	..	..		..	..	..	..	..	..	
7. Flying or falling objects.....	..	..		..	..	..	..	..	..	
8. Gas (burns or asphyxiation).....	..	..		..	..	..	..	..	..	1
9. Scalding (steam or water).....	..	..		..	..	..	..	..	..	
10. Electricity.....	..	..		..	..	..	..	..	..	
11. Hand tools, axes, bars, etc.....	..	..		..	..	..	..	..	..	
12. Nails, splinters, etc.....	..	..		..	..	..	..	..	..	
13. Burns from matte, slag or molten metal (pouring or spilling).....	..	..		..	..	..	..	..	..	
14. Hot metal explosions.....	..	..		..	..	..	..	..	..	
15. Other causes.....	..	..		..	..	..	..	..	..	
Totals.....	..	..		..	..	..	..	..	..	1
QUARRIES, CLAY PITS, OIL SHALE MINES AND ROCK EXCAVATIONS										
	Superintendent- ents and Foremen			Teamsters		Drillmen		Laborers		
	1929	1930		1929	1930	1929	1930	1929	1930	
1. Haulage.....	..	..		..	..	..	..	..	..	
2. Machinery.....	..	..		..	..	..	..	..	..	
3. Other causes.....	..	..		..	..	..	3	1	..	
Totals.....	..	..		..	..	..	3	1	..	
PLACERS AND DREDGES										
	Miners			Dredgemen		Laborers				
	1929	1930		1929	1930	1929	1930	1929	1930	
1. Machinery.....	..	..		..	..	..	..	..	..	
2. Electricity.....	..	..		..	..	..	..	..	..	
3. Other causes.....	..	..		..	..	..	1	..	..	
Totals.....	..	..		..	..	..	1	..	..	



## LIST OF OPERATING MINES IN VARIOUS COUNTIES OF COLORADO

## OPERATING MINES IN ARCHULETA COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Copper Queen Group	Pagosa Springs	Thomas Alston	Pagosa Springs	Gold, Silver, Lead, Zinc (c)
Treasure Mountain	Pagosa Springs	Treasure Mountain M. M. and T. Co.	Pagosa Springs	Gold, Silver, Lead (c)

## OPERATING MINES IN BOULDER COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Alaska Tunnel	Ward	Alaska Gold Mines Corporation	519 Cooper Bldg., Denver	Gold, Silver, Lead, Copper
Arapahoe Group	Ward	Walter H. Wilson	12th St at 9th Ave., Boulder	Gold, Silver (c)
Argo, Brown Star, Fort & Blue Jay	Jamesstown	J. H. Hardy and Robert J. Jameson	Jamesstown	Fluorspar
Baron	Salina	Garfield Charles	Union League Club, Chicago, Ill.	Gold, Silver, Lead (c)
Bighorn	Salina	Ponroy Leasing Company	369 Arapahoe St., Boulder	Gold, Silver (c)
Cardfield	Boulder	James Brown	Salina, via Boulder	Gold
Chancellor	Jamesstown	Fred Dopp	Jamesstown	Fluorspar
Clipper (n)	Crisman	Clipper Gold Mining Company	Rock Springs, Wyoming	Gold, Silver
Clyde	Nederland	Wolf Tongue Mining Company	First Nat'l Bank Bldg., Boulder	Tungsten
Gold Spring (n)	Nederland	Wolf Tongue Mining Company	First Nat'l Bank Bldg., Boulder	Tungsten
Cracker Jack	Jamesstown	J. E. Lee and F. W. Gallagher	226 19th St., Boulder	Gold, Silver
Dime	Boulder	A. J. Reynolds	West Side Court, Denver	Gold
Dolly Varden (n)	Sims	A. P. McCormick	Box 110, Boulder	Gold, Silver (c)
Empire Group (a)	Ward	Alld Syndicate Mining Company	Jamesstown	Gold, Silver (c)
Gold Dollar (a)	Ward	Sam Gembird	Ward	Gold, Silver (c)
Golden Eagle (a)	Salina	A. W. Whitfield	Box 8, Boulder	Gold, Silver
Good Friday (n)	Boulder	Paul Craig	839 Mapleton St., Boulder	Tungsten
Great West (a)	Ward	Volcanic Gold Corporation	1744 Glenarm St., Denver	Gold, Silver (c)
Hillside	Sugar Loaf	Vanadium Corporation of America	Nat'l State Bank Bldg., Boulder	Tungsten
Hornstead (a)	Ward	M. A. Sacks	905 Euclid St., Boulder	Gold, Silver
Iron and Silver (n)	Ward	M. E. Vale	Ward, Star Route	Gold, Silver (c)
Kicker	Nederland	Wolf Tongue Mining Company	First Nat'l Bank Bldg., Boulder	Tungsten
Lakewood	Nederland	Vanadium Corporation of America	Nat'l State Bank Bldg., Boulder	Tungsten
Logan	Crisman	Electra Engineering and Development Company	Crisman, via Star Route, Boulder	Gold, Silver (c)
Long Chance	Nederland	William H. Cowdery and Assoc.	Nederland	Tungsten
May (a)	Sugar Loaf	Walter N. Ramsey and Assoc.	Box 375, Boulder	(c)
Morning Glory	Gold Hill	Otto Wiederhold	528 12th St., Boulder	Gold, Silver, Lead
Oregon	Boulder	Vanadium Corporation of America	Nat'l State Bank Bldg., Boulder	Tungsten

(a) Operated for part of the year only.

(c) No production reported in 1930. (n) Mill operated in connection with mine.

## OPERATING MINES IN BOULDER COUNTY, 1930—Continued

Name	Location	Operator	Address	Character of Product
Pandora.....	Nederland.....	Pandora Metals, Inc.....	220 E. and C. Building, Denver.	Gold, Silver (c)
Paymaster.....	Boulder.....	M. C. Morrison.....	2445 Walnut St., Boulder.....	Gold, Tungsten
Plow Boy.....	Boulder.....	Gus Pillus.....	Sunshine, via Boulder.....	Gold, Silver
Poorman.....	Boulder.....	B. F. Green and J. G. Clark.....	Sullivan Building, Boulder.....	Gold, Silver
Potosi.....	Nederland.....	Potosi Carbon Mining Company.....	Nederland.....	Gold, Silver, Lead
Puzzler (a).....	Ward.....	G. L. Stanley and Assoc.....	Ward, Star Route.....	Gold, Silver
Quaker.....	Sugar Loaf.....	Vanadium Corporation of America.....	Nat'l State Bank Bldg., Boulder.....	Tungsten
Robin (a).....	Nederland.....	Sam and Frank Gembrini.....	Ward.....	(c)
Rogers Tract.....	Nederland.....	Rogers Estate—George W. Teal.....	Boulder.....	Tungsten
Salina (a).....	Salina.....	P. J. Mix.....	1821 16th St., Boulder.....	Gold, Silver (c)
San Domingo (a).....	Boulder.....	Fred Mowry.....	Ward.....	Gold, Silver (c)
Spencer Mountain.....	Eldora.....	Mogul Enterprise Production Co.....	911 Midland Sav. Bldg., Denver.	Gold, Silver, Vanadium (c)
Tambourine.....	Boulder.....	O. P. Pherson and B. P. Bailey.....	1743 Mapleton St., Boulder.....	Gold, Silver
Twain Brothers (a).....	Nederland.....	David D. Weber.....	2329 Welton St., Denver.....	Gold, Silver
United Mines Group.....	Gold Hill.....	United Mines Company.....	7-15 Citizens' National Bank Bldg., Boulder.....	Gold, Silver, Zinc
Vasco 1-10.....	Boulder.....	Tungsten Production Company, Inc.....	Sullivan Bldg., Boulder.....	Gold, Silver, Zinc
Wano.....	Jamestown.....	Wano Mines and Power Corporation.....	301 Continental Oil Bldg., Denver.	Gold (c)
Wood Mountain (m).....	Boulder.....	Mountain Plains Co., Inc.....	Sullivan Bldg., Boulder.....	Gold, Silver
Yellow Jacket 1 and 2.....	Sugar Loaf.....	C. H. Craig.....	1107 10th St., Boulder.....	(c)
Yellow Pine.....	Crisman.....	Electra Engineering and Development Company.....	Crisman, Star Route, via Boulder.	Gold, Silver (c)

## OPERATING MINES IN CHAFFEE COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Jackrabbit Group.....	Buena Vista.....	Bertschy and Gresham.....	Buena Vista.....	Fluorspar
Matilda.....	St. Elmo.....	Silver Queen Mining Company.....	509 Central Savings Bank Bldg., Denver.....	Gold
Sitting Bull.....	Mount Princeton.....	Silver Queen Mining Company.....	509 Central Savings Bank Bldg., Denver.....	Gold
White King Group.....	Salida.....	American Fluorspar Corporation.....	McIntyre Bldg., Colorado Spr'gs	Fluorspar

## OPERATING MINES IN CLEAR CREEK COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Albro.....	Dumont.....	Harris and Dingle.....	Dumont.....	Gold, Silver, Copper
Almaden (a).....	Idaho Springs.....	Francis Phillips and Homer McAnulty.....	Idaho Springs.....	Gold, Silver (c)
American (a).....	Dumont.....	C. A. Cutlar.....	Dumont.....	Gold (c)
Benton (m).....	Empire.....	Walter Swanson.....	1675 Logan St., Denver.....	Gold

Black Eagle (a).....	Idaho Springs.....	Consolidated Smelter and Metals Co., 4775 East 6th Ave., Denver.....	Gold, Silver, Lead, Copper
Blizzard (a).....	Idaho Springs.....	Mrs. Rose Jordan and Assoc., 1340 Navajo St., Denver.....	Gold, Silver
Bride (a).....	Idaho Springs.....	Frank Wagner.....	Gold, Silver, Lead, Copper, Zinc
Brighton.....	Idaho Springs.....	Virgin Mining Company.....	Gold, Silver, Lead, Copper, Zinc
Caddo (a) (m).....	Idaho Springs.....	Caddo Mining and Milling Company, 1017 W. 22nd St., Oklahoma City, Okla.....	Gold, Silver (c)
Calvin.....	Idaho Springs.....	C. W. Light and Melvin Chiles.....	Gold, Silver, Lead
Centennial (m).....	Georgetown.....	Western States Mining Company.....	Gold, Silver, Lead, Copper
Central Tunnel and Edgar Mine (m).....	Idaho Springs.....	North American Mining Company.....	404 Interstate Trust Bldg., Denver
Challenge (a).....	Empire.....	Kenneth Sharp.....	Gold, Silver
Columbine Tunnel (a).....	Empire.....	Kenneth Sharp.....	Gold, Silver (c)
Denver Tunnel.....	Georgetown.....	Metals Tunnel Company.....	2555 W. 37th Ave., Denver.....
Dexter.....	Idaho Springs.....	Sunday Leasing Company.....	1525 Market St., Denver.....
Dorl Perkins.....	Idaho Springs.....	Charles McNauve.....	Gold, Silver, Lead, Copper
Esmeralda (a).....	Idaho Springs.....	A. P. Bean, Sr., and A. P. Bean, Jr.....	446 Ocean Ave., Brooklyn, N. Y. Gold, Silver, Lead, Zinc (c)
Free Gold (a).....	Idaho Springs.....	E. O. Jackson and Associates.....	226 East 20th Ave., Denver.....
Golden Crown (a).....	Empire.....	George Lewis and Associates.....	1731 Arapahoe St., Denver.....
Grand and Clear Creek (a).....	Empire.....	G. H. Anderson and Associates.....	Gold, Silver, Lead (c)
Griffith (m).....	Georgetown.....	Pioneer Mining Syndicate, Inc.....	Georgetown.....
Holenshaw.....	Dumont.....	Warren and Picklesimer.....	Gold, Silver, Lead, Copper, Zinc (c)
Hyland.....	Idaho Springs.....	Ben Sharp.....	Dumont.....
Ingram.....	Idaho Springs.....	Ernest Bauer and Company.....	Idaho Springs.....
Iron King (a).....	Empire.....	Edward Carlson.....	Idaho Springs.....
Kangaroo (a).....	Idaho Springs.....	P. A. Peabody and Associates.....	Idaho Springs.....
Liberty (a).....	Empire.....	Previous Metals Mining Company.....	127 So. Broadway, Denver.....
Lincoln.....	Idaho Springs.....	N. E. Wilson.....	Box 685, Idaho Springs.....
Little Joe (a).....	Idaho Springs.....	Joe Austin.....	2244 Stout St., Denver.....
Lombard (a) (m).....	Idaho Springs.....	Swift Sure Mining Company.....	408 Patterson Bldg., Denver.....
Matthe (m).....	Idaho Springs.....	Matthe Consolidated Mines, Inc.....	340 Continental Oil Bldg., Denver

(a) Operated for part of the year only

(c) No production reported in 1930.

(m) Mill operated in connection with mine

## OPERATING MINES IN CLEAR CREEK COUNTY, 1930—Continued

Name	Location	Operator	Address	Character of Product
Mattie Jack.	Dumont.	G. U. Shoemaker.	Tie Sliding, Wyoming.	Gold, Silver, Lead, Zinc
Mendota.	Silver Plume.	Consolidated Smelter and Metals Co.	4475 East 6th Ave., Denver.	Gold, Silver (c)
Molly Bawn (a).	Empire.	K. F. and Ed Sharp.	Empire.	Gold, Silver (c)
M. Sidney.	Georgetown.	M. Sidney.	Georgetown.	Gold, Silver (c)
P. T. (a).	Idaho Springs.	P. T. Leasing Company.	Idaho Springs.	Gold, Silver (c)
Red Elephant Group (a).	Lawson.	Red Elephant Mining Company.	Lawson.	Silver, Lead (c)
Scotia Group (a) (m).	Empire.	Atlantic Gold Mining Company.	Empire.	Gold
Scotia (a).	Empire.	W. F. Lively.	Empire.	Gold, Silver, Lead, Copper (c)
Silver Mountain.	Empire.	Henry C. Nelson.	Empire.	Gold
Silver Queen.	Grant.	J. F. Kimberly and J. L. Henritzy.	Grant, via Shawnee.	Gold, Silver, Lead, Zinc
Storrs.	Empire.	E. E. Wood and L. A. Terry.	Empire.	Gold, Silver (c)
Sunnyside.	Idaho Springs.	Gold Crescent Mining Company.	527 Temple Court, Denver.	Gold, Silver (c)
Terrible (m).	Silver Plume.	Utah Rare Metals Company.	424 Felt Bldg., Salt Lake City, Utah	Gold, Silver, Lead
Torpedo and Sky Rocket Group.	Idaho Springs.	Idaho Springs Gold Producing Co., Inc.	Idaho Springs.	Gold, Silver, Lead
Uilla (a).	Empire.	W. F. Lively.	Empire or Arvada.	Gold, Silver, Lead, Zinc (c)
Virginia City.	Empire.	M. D. Voudy.	402 Denver Theater Bldg., Denver.	Gold, Silver, Lead, Copper (c)
West Gold Group (m).	Idaho Springs.	West Gold Mining Company.	319 Security Bldg., Denver.	Gold, Silver
Whale Group (a).	Idaho Springs.	Mount Eva Mining Co., Inc.	Idaho Springs.	Gold, Silver
Wilson.	Empire.	Mrs. A. C. Wilson Zell.	Empire.	Gold, Silver

## OPERATING MINES IN CUSTER COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Akin Tunnel.	Wetmore.	Charles Akin.	Wetmore.	Gold (c)
Basick Extension.	Querida.	Silver Lead Company.	Querida.	Gold, Silver
Cloverdale.	Hillside.	Cloverdale Mines Company.	Hillside.	Gold (c)
H. and M. (a).	Westcliffe.	H. and M. Mining Company.	Care of Walker Motor Co., Pueblo.	Gold, Silver, Lead
Terrible.	Ilse.	Robert D. Webb.	Minden, Louisiana.	Lead (c)



## OPERATING MINES IN DOLORES COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Argentine-Blackhawk	Rico	Rico Argentine Mining Company	539 Atlas Bldg., Salt Lake City, Utah	Silver, Lead, Copper, Zinc
Burns Group (a)	Rico	Mines Leasing Syndicate	Rico	Gold, Silver, Lead, Copper, Zinc (c)
Clan Campbell (a)	Rico	Falcon Lead Mining Company	Rico	Silver, Lead, Zinc (c)
Falcon	Rico	Falcon Lead Mining Company	Rico	Silver, Lead, Copper, Zinc
Hicks	Rico	Louis W. and George S. Hicks	Rico	Gold, Silver, Lead, Copper, Zinc
Pro Patria and Revenue	Rico	Rico Enterprise Mining Company	Rico	Gold, Silver, Lead, Copper, Zinc
Wellington	Rico	St. Louis Smelting and Refining Co.	722 Chestnut St., St. Louis, Mo.	Gold, Silver, Lead, Copper, Zinc
Yellow Jacket	Rico	Falcon Lead Mining Company	Rico	Silver, Lead, Zinc

## OPERATING MINES IN EAGLE COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Eagle Mines (m)	Gilman	Empire Zinc Company	Gilman	Gold, Silver, Lead, Copper, Zinc (c)
Liberty	Redcliff	Liberty Mines Syndicate, Inc.	Box 931, Leadville	Silver, Lead, Zinc (c)

## OPERATING MINES IN FREMONT COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Copper Queen	Parkdale	Copper Queen, Inc.	205 W. Abriendo Ave., Pueblo	Copper
Green Mountain (a)	Canon City	R. O. Sperry	Apt. 3, Jones Apartment, Canon City	Copper (c)

## OPERATING MINES IN GARFIELD COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Grand View (m)	Rifle	Grand View Mines Corporation	Rifle	Gold, Silver, Lead, Zinc
U. S. Vanadium (m)	Rifle	U. S. Vanadium Corporation	30 East 42nd St., New York, N. Y.	Vanadium

(a) Operated for part of the year only. (c) No production reported in 1930 (m) Mill operated in connection with mine

## OPERATING MINES IN GILPIN COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Allie.....	Blackhawk	Wm. McKinzie.....	Blackhawk.....	Gold, Silver, Lead
Beacon.....	Rollinsville.....	Beacon Mining and Milling Company.....	1641 Stout St., Denver.....	Gold, Silver, Copper
Blue Diamond.....	Blackhawk.....	Blue Diamond Mines, Inc.....	Blackhawk.....	Gold, Silver, Lead
Bullion.....	Central City.....	Bullion Mining Company.....	Central City.....	Gold, Silver, Lead
Chain O' Mines (m).....	Central City.....	Chain O' Mines, Inc.....	5 So. Wabash Ave., Chicago, Ill.....	Gold, Silver, Lead, Copper, Zinc
Champion.....	Blackhawk.....	O. C. Rediek Mining Company.....	Omaha Nat'l Bank, Omaha, Neb.....	Gold, Silver, Lead
Cousin Jack.....	Central City.....	L. Liberman and Noah Williams.....	Central City.....	Gold, Silver
Delmonico.....	Central City.....	Delmonico Development Company.....	144 Shute St., Everett, Mass.....	Gold, Silver, Lead, Copper, Zinc (c)
Eagle Group.....	Rollinsville.....	Onelda Mining Company.....	1535 Grant St., Denver.....	Gold, Silver
Egyptian.....	Central City.....	Quartz Hill Central Mining Co.....	732 U. S. National Bank Bldg., Denver.....	Gold, Silver, Lead, Copper
Gold Basin Group.....	Rollinsville.....	I. E. Snoke and Associates.....	Windsor Hotel, Denver.....	Gold, Silver (c)
Gold Cup.....	Central City.....	Samuel Thomas and Company.....	Central City.....	Gold, Silver, Lead
Great Mammoth.....	Central City.....	Gold Patch Mining Company.....	Idaho Springs.....	Gold, Silver
Harrison Tunnel.....	Apex.....	R. C. Mining Company, Inc.....	2124 Cumming St., Omaha, Neb.....	Gold, Silver, Lead
Hunter-Bates (a).....	Central City.....	Hunter-Bates Mining Company.....	Continental Oil Bldg., Denver.....	Gold, Silver (c)
Illinois.....	Tolland.....	Mammoth Development Company.....	Tolland.....	Gold, Silver, Lead (c)
Jennie Blanche.....	Blackhawk.....	Samuel Alexander.....	526 Mining Exchange Bldg., Denver.....	Gold, Silver, Lead, Zinc
Keystone Bates.....	Blackhawk.....	Otto Ruttkanup.....	Blackhawk.....	Gold, Silver, Lead
Kirk.....	Russell Gulch.....	Ware-Brown Partnership and Polar Star M. and M. Co.....	Central City.....	Pitchblende
Liberty (a).....	Blackhawk.....	T. H. Kruse.....	Arvada.....	Gold, Silver, Lead (c)
Lone Star No. 2 (a).....	Blackhawk.....	W. I. Spratt and J. E. Kennedy.....	1451 California St., Denver.....	Gold, Silver (c)
Marquette Group.....	Blackhawk.....	Marquette Mining Company.....	406 Mining Exchange Bldg., Denver.....	Gold, Silver, Lead, Zinc
Master Key Tunnel (a).....	Blackhawk.....	J. L. Fawcett.....	1953 Lincoln St., Denver, or Blackhawk.....	Gold, Silver (c)
Meeker.....	Central City.....	Success Mining Syndicate.....	502 Midland Sav. Bldg., Denver.....	Gold, Silver, Lead, Copper
Nashville.....	Idaho Springs.....	Elmwood Mining Company.....	Idaho Springs.....	Gold, Silver, Lead, Copper (c)
Palace Group.....	Blackhawk.....	Harris C. Feehan.....	Blackhawk.....	Gold, Silver, Lead (c)
Pay Me (a).....	Central City.....	Silver Creek Gold Mining Co.....	310 Boston Bldg., Denver.....	Gold (c)
Perrin.....	Russell Gulch.....	Perrin Mines, Inc.....	State Office Bldg., Denver.....	Gold, Silver

Pittsburgh.....	Central City.....	Ute Gold Mining Company.....	520 U. S. National Bank Bldg. Denver.....	Gold, Silver, Lead, Copper
Rex.....	Rollinsville.....	Rex Developing Company.....	1029 S. Clarkson St., Denver.....	Gold, Silver (c)
Saratoga.....	Russell Gulch.....	Saratoga Gold Mines, Inc.....	730 Majestic Bldg., Denver.....	Gold, Silver, Copper
Smuggler (m).....	Rollinsville.....	New Life Mining and Milling Corp.....	49 Westminster St., Providence, Rhode Island.....	Gold, Silver, Copper (c)
Tom Tom.....	Central City.....	Chain O' Mines, Inc.....	5 S. Wadsworth Ave., Chicago, Ill.....	Gold, Silver, Copper
Victoria.....	Rollinsville.....	George H. Knutzen.....	Rollinsville.....	Gold, Silver, Copper (c)
War Eagle.....	Rollinsville.....	Knute Naverster and Associates.....	Rollinsville.....	Gold, Silver, Copper
We Got 'Em.....	Blackhawk.....	E. J. Miller and Associates.....	Blackhawk.....	Gold

### OPERATING MINES IN GRAND COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Elk Mountain.....	Kremmling.....	Elk Mountain Copper Company.....	Kremmling.....	Gold, Silver, Lead, Copper, Zinc
Gus Creek.....	Parshall.....	Charles A. Fletcher.....	Parshall.....	Gold, Silver, Lead, Copper, Zinc (c)
Minnesota (a).....	Fraser.....	George D. Parks.....	Fraser.....	Gold, Silver, Copper
Mt. Vasquez (a).....	Fraser.....	Mt. Vasquez Mines Company.....	404 University Bldg., Denver.....	Gold, Silver, Lead, Copper, Zinc (c)
Ray Ida (a).....	Empire.....	Ray Ida Mines Company.....	2614 Vine St., Denver.....	Gold, Silver (c)
Ready Cash (a).....	Empire.....	Jones Pass Leasing Company.....	264 S. Washington St., Denver.....	Gold, Silver (c)

### OPERATING MINES IN GUNNISON COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Bon Ton.....	Pitkin.....	Stone-Davis Mines Corporation.....	45 John St., New York City.....	Molybdenum, Gold, Silver, Copper
Carter.....	Ohio City.....	Carter Mines Company.....	Ohio City.....	Gold, Silver, Lead (c)
Clara L. Group.....	Crested Butte.....	Clara L. Mining Company.....	3244 Graves Court, Chicago, Ill.....	Lead, Zinc (c)
Fairview (a).....	Pitkin.....	Fairview Cleopatra Mines, Inc.....	2626 Ash St., Denver.....	Silver, Lead, Copper (c)
Gold Monument Group.....	Gunnison.....	James F. Robinson and Associates.....	303 Colorado Bldg., Denver.....	Gold, Silver, Lead (c)
Good Hope and Vulcan.....	Iola.....	Vulcan Consolidated Mines Corp.....	165 Broadway, New York City.....	Gold, Silver, Cop- per, Zinc
Hattle H.....	Tincup.....	Silver Queen Mining Company.....	509 Central Savings Bank Bldg., Denver.....	Gold, Silver, Lead

(a) Operated for part of the year only.

(c) No production reported in 1930.

(m) Mill operated in connection with mine.

## OPERATING MINES IN GUNNISON COUNTY—Continued

Name	Location	Operator	Address	Character of Product
Roosevelt.....	Pitkin.....	Roosevelt Mines and Electric Co.....	Pitkin.....	Gold, Silver, Copper (c)
Stewart Group.....	Crested Butte.....	Stewart Mining Company.....	Crested Butte.....	Silver, Lead, Copper, Zinc (c)
True Blue.....	Tincup.....	True Blue Mining Company.....	628 First National Bank Bldg., Denver.....	Gold, Silver, Lead, Copper (c)
Victory.....	Ohio City.....	Dr. B. F. and L. B. Riley.....	Ohio City.....	Gold, Silver, Lead, Zinc (c)

## OPERATING MINES IN HINSDALE COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Big Blue Group.....	Lake City.....	R. D. Webb.....	Minden, Louisiana.....	Silver, Lead (c)
Empire Chief (m).....	Lake City.....	Empire Chief Mining Company.....	505 U. S. National Bank Bldg., Denver.....	Gold, Silver, Lead, Copper, Zinc
Highland Chief.....	Lake City.....	R. D. Webb.....	Minden, Louisiana.....	Silver, Lead, Copper, Zinc
Mineral Hill-Good Luck Group.....	Lake City.....	Silver Queen Mining Company.....	509 Central Savings Bank Bldg., Denver.....	Silver, Lead (c)
Silver Jack.....	Montrose.....	Silver Jack Mining and Milling Co.....	Montrose.....	Gold, Silver, Lead (c)
Ute and Ulay (a) (m).....	Lake City.....	M. B. Burke Mining and Investment Company.....	301 Humboldt St., Denver.....	Gold, Silver, Lead, Zinc (c)

## OPERATING MINES IN JACKSON COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Colorado Fluorspar.....	Cowdrey.....	Colorado Fluorspar Corporation.....	25 Broad St., New York, N. Y.....	Fluorspar (c)
Crescent (a).....	Walden.....	Crescent City Mining and Development Company.....	Walden.....	Gold, Silver
Gold Cup (a).....	Rand.....	Gold Cup—Fred Jordan Estate.....	Rand or Coalmont.....	Gold, Silver (c)
Leader Nos. 1 and 2.....	Rand.....	Axel Sannes and W. Beamont.....	Rand.....	Gold, Silver, Lead, Zinc (c)
Wolverine.....	Cowdrey.....	North Park Mining and Development Company.....	Cowdrey.....	Gold, Silver, Lead, Copper, Zinc



## OPERATING MINES IN LAKE COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Baby Shaft.....	Leadville	Stevens Lease.....	121 S. Toledo Ave., Leadville.....	Manganese, Iron
Chaوتاqua.....	Leadville	Art Ward Leasing Company.....	Leadville.....	Gold, Silver, Lead
Climax Molybdenum (m).....	Climax.....	Climax Molybdenum Company.....	421 Continental Oil Building Denver.....	Molybdenum
Evelyn Shaft.....	Leadville	Leadville Colorado Development Corp.....	Leadville.....	Gold, Silver (c)
Granite.....	Granite.....	H. and H. Mining Company.....	Granite.....	Gold, Silver, Lead
Ibex.....	Leadville.....	Ibex Mining Company.....	Leadville.....	Gold, Silver, Lead, Copper, Zinc
Leadville Deep Mines.....	Leadville.....	Leadville Deep Mines Company.....	Bank Annex, Leadville.....	Gold, Silver, Lead, Copper, Zinc
Mald Lease-Adams Shaft.....	Leadville.....	Evans-Walloway Lead Company.....	Leadville.....	Silver, Lead, Cop- per, Zinc
Mammoth Placer Group.....	Leadville.....	North Leadville Development Corp.....	Leadville.....	Silver (c)
Nicholson.....	Leadville.....	Adams and Wolfstone Lease.....	Box 604, Leadville.....	Lead, Zinc
Peterson Shaft.....	Leadville.....	Eric Peterson and Associates.....	Leadville.....	Manganese, Iron
Resurrection.....	Leadville.....	East Leadville Development Corp.....	Leadville.....	Gold, Silver, Lead, Zinc
Silver Spoon.....	Leadville.....	Silver Spoon Development Company.....	225 First National Bank Bldg., Denver.....	Gold, Silver, Lead, Zinc
South Ibex Shaft.....	Leadville.....	John Cortellini.....	329 W. 8th St., Leadville.....	Gold
Star No. 5 Shaft.....	Leadville.....	Cramer and Company.....	121 S. Toledo Ave., Leadville.....	Manganese, Iron
Yak Tunnel.....	Leadville.....	Yak Mining, Milling and Tunnel Co.....	Continental Oil Bldg., Denver.....	Gold, Silver, Lead, Zinc
Yosemite Group.....	Granite.....	Marquette Mining Company.....	406 Mining Exchange Building, Denver.....	Gold, Silver

## OPERATING MINES IN LA PLATA COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Gold King.....	La Plata.....	La Plata Mines Company.....	La Plata.....	Gold, Silver, Lead, Zinc
May Day.....	Hesperus.....	Independent Mining and Leasing Co.....	Hesperus.....	Gold, Silver

(a) Operated for part of the year only. (c) No production reported in 1930. (m) Mill operated in connection with mine.

## OPERATING MINES IN LARIMER COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Cash Group (a)	Logcabin	Cash Gold Mining Company	2305 Gaylord St., Denver	Gold, Silver, Lead, Copper (c)
Colorado (a)	Logcabin	Colonial Investment Company	Fort Collins or Logcabin	Gold, Silver (c)
Free Gold (a)	Logcabin	Poudre Gold Mining Company	Fort Collins or Logcabin	Gold, Silver (c)
Gold Bug (a)	Logcabin	George Gabriel	Logcabin	Gold (c)
Little Helen Nos. 1 and 2 (a)	Logcabin	G. W. Wirick	Logcabin	Gold, Silver (c)
Prodigal (a)	Manhattan	J. W. Rigdon	228 N. Loomis St., Fort Collins	Gold, Silver (c)
Rockfield (a)	Logcabin	S. A. and W. T. Prendergast	Logcabin	Copper (c)
Welcome (a)	Logcabin	S. A. and W. T. Prendergast	Logcabin	Gold, Silver (c)

## OPERATING MINES IN MINERAL COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Amethyst	Creede	Amethyst Lease	Creede	Gold, Silver
Bethel	Creede	D. K. Blake and Company	Box 346, Victorville, Calif.	Silver (c)
Commodore	Creede	Without-Commodore Lease, Inc.	Creede	Silver
Fluorspar	Wagon Wheel Gap	Colorado Fuel and Iron Company	Continental Oil Bldg., Denver	Fluorspar
Happy Thought	Creede	Spain Mining, Milling and Leasing Co.	210 State Office Bldg., Denver	Gold, Silver
Last Chance	Creede	Morgan and Sloan	Creede	Gold, Silver
New York	Creede	Morgan and Sloan	Creede	Gold, Silver
Volunteer	Creede	Morgan and Sloan	Creede	Gold, Silver

## OPERATING MINES IN MOFFAT COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Bromide	Greystone	Robert Pherson	Greystone	Silver, Copper

## OPERATING MINES IN MONTEZUMA COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Euclid Group	Mancos	Euclid Gold Mining Company	Box 412, Mancos	Gold, Silver (c)
Tenderfoot-R. A. P. Group	Mancos	W. G. Holmes and Associates	Mancos	Gold

## OPERATING MINES IN MONTROSE COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Camp Marvel Carnoofite (m)	Naturita	Rare Metals Corporation	Naturita or 1106 West Oak St., Fort Collins.	Radium, Uranium, Vanadium
Monogram (m)	Naturita	U. S. Vanadium Corporation	Naturita	Carnotite

## OPERATING MINES IN OURAY COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Barstow (a)	Ouray	Barstow Mining and Milling Co.	1422 17th St., Denver	Gold, Silver, Lead, Copper, Zinc (c)
Callope	Ouray	B. P. Bailey	Box 752, Austin, Texas	Gold, Silver, Lead, Zinc (c)
Camp Bird (m)	Ouray	King Lease, Inc.	Ouray	Gold, Silver, Lead, Copper
Camp Bird Tunnel	Ouray	Camp Bird Tunnel, Mining and Transportation Company	307 Colorado National Bank Bldg., Denver	Gold, Silver, Lead
Dunmore Group (a)	Ouray	K. A. and I. G. MacLennan	Ouray	Gold, Silver, Copper (c)
Guadaloupe	Ouray	L. R. Reed	Ouray	Gold, Silver, Copper
Mickey Breen	Ouray	Arthur Larson	Ouray	Gold, Silver, Lead, Zinc
St. Louis Independent Group (m)	Ouray	St. Louis Independent Smelter and Refining Company	Ouray	Gold, Silver, Lead

## OPERATING MINES IN PARK COUNTY, 1930

Name	Location	Operator	Address	Character of Product
American (a)	Alma	W. A. Ellis	Brown Palace Hotel, Denver	Gold (c)
Caldora	Alma	D. C. Harrington and Associates	Alma	Gold, Silver
Champaign	Fairplay	Protes Development Co., Ltd.	Toronto, Ontario	Gold, Silver, Lead (c)
Funston	Alma	Bucksin Gulch Mining Company	Alma	Gold, Silver, Lead
Garo Copper	Garo	Garo Copper Syndicate	924 East 17th Ave., Denver	Copper, Vanadium
Hock Hocking	Alma	Weston Metals Corporation	509 Exchange Bldg., Denver	Gold, Silver
Juanta May and Extensions	Alma	Gold Clad Mines, Inc.	1444 Bellaire St., Denver	Gold, Silver

(a) Operated for part of the year only.

(c) No production reported in 1930.

(m) Mill operated in connection with mine.

## OPERATING MINES IN PARK COUNTY, 1930—Continued

Name	Location	Operator	Address	Character of Product
King.....	Alma.....	A. J. Sandusky.....	Alma.....	Gold, Silver
London.....	Alma.....	London Gold Mines Company.....	First National Bank Bldg., Colorado Springs.....	Gold, Silver, Lead, Zinc
Missouri.....	Webster.....	C. M. Snyder.....	Shawnee.....	Gold, Silver, Lead, Copper, Bismuth
Mosquito (a).....	Alma.....	Charles Hendron.....	417 West 4th Ave., Denver.....	Silver, Lead (c)
No End Group.....	Alma.....	Alma Gold Corporation.....	706 First National Bank Bldg., Denver.....	Gold, Silver
North London (m).....	Alma.....	London Leasing Company.....	1080 Sherman St., Denver.....	Gold, Silver, Lead, Zinc
Orphan Boy.....	Alma.....	Orphan Boy Lease.....	1401 E St., Golden.....	Gold, Silver, Lead, Zinc
Preparedness.....	Alma.....	I. B. Baldock.....	Alma.....	Gold, Silver
Rhine Gold.....	Alma.....	Sarsfield Consolidated Mining and Milling Company.....	303 Denham Bldg., Denver.....	Gold, Silver
Susannah.....	Guffey.....	Susannah Mining Company.....	Guffey.....	Gold
Sweet Home.....	Alma.....	Edwin C. Spray.....	2110 Market St., Denver.....	Gold, Silver, Lead, Copper, Zinc
Webber.....	Alma.....	Alma Syndicate, Inc.....	308 First National Bank Bldg., Denver.....	Gold, Silver, Lead
Yellowstone.....	Guffey.....	B. J. Hillman.....	Guffey.....	Gold, Silver

## OPERATING MINES IN PITKIN COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Cowenhoven Tunnel.....	Aspen.....	Continental Divide Development Co.....	710 U. S. National Bank Bldg., Denver.....	Silver, Lead
Durgen Tunnel.....	Aspen.....	Estate of David R. C. Brown, Harry A. Brown, Agent.....	Aspen.....	Silver, Lead
Hope Tunnel.....	Aspen.....	Mike Brand and Associates.....	Aspen.....	Silver, Lead
Independence.....	Aspen.....	D. P. Rohlfing.....	Aspen.....	Silver, Lead (c)
Jenny Lind Tunnel.....	Aspen.....	Continental Divide Development Co.....	710 U. S. National Bank Bldg., Denver.....	Silver (c)
Midnight (m).....	Aspen.....	Midnight Mining Company.....	Aspen.....	Silver, Lead, Zinc
Smuggler and Durant Tunnels.....	Aspen.....	Smuggler Leasing Company.....	Room 1012, 61 Broadway, New York, N. Y.....	Silver, Lead, Zinc
Veteran Tunnel.....	Aspen.....	D. P. Rohlfing.....	Aspen.....	Silver, Lead



# OPERATING MINES IN RIO GRANDE COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Miser and Guadalupe Group	Jasper	Marian Mining Company	727 First National Bank Bldg. Denver	Gold, Silver, Lead, Copper

## OPERATING MINES IN ROUTT COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Copper King	Copper Spur	Cole Mining and Milling Company	Copper Spur	Lead, Copper, Zinc (c)
Master Key	Columbine	Master Key Mining Company	Columbine	Gold, Silver (c)
Royal Flush	Columbine	Hahns Peak Gold Mining and Milling Company	Room 3, Algoma Bldg., Oshkosh, Wisconsin	Gold, Silver, Lead, Copper, Zinc
Tom Thum	Steamboat Springs	Tom Thum Leaseholders	Steamboat Springs	Gold, Silver, Lead (c)

## OPERATING MINES IN SAGUACHE COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Josie K. Folsom	Saguache	Josie K. Folsom Mining and Milling Company	524 Kittredge Bldg., Denver	Gold Silver, Lead, Copper, Bismuth (c)
Klondike	Saguache	G. E. Cotton and Assoc.	Saguache	Gold, Silver, Lead, Copper, Bismuth (c)
Orient	Villa Grove	Colorado Fuel and Iron Company	Continental Oil Building, Denve	Iron
Rawley	Bonanza	Rawley Mines, Inc.	120 Broadway, New York, N. Y.	Gold, Silver, Lead, Copper, Zinc

## OPERATING MINES IN SAN JUAN COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Buffalo Boy (m)	Silverton	Vertex Mining Company	570 Bullitt Bldg., Philadelphia, Pa.	Gold, Silver, Lead, Copper, Zinc
Copper Bell	Silverton	United Operating Trust, Inc.	Box 161, Rochester, New York	Gold, Silver, Lead, Copper
Garryowen, etc. (m)	Silverton	Dresser Mining Company	Box 448, Silverton	Gold, Silver, Lead, Copper, Zinc
(a) Operated for part of the year only.		(c) No production reported in 1930.	(m) Mill operated in connection with mine.	

## OPERATING MINES IN SAN JUAN COUNTY, 1930—Continued

Name	Location	Operator	Address	Character of Product
Iowa (m)	Silverton	Colorado Mexico Mining Co.	Silverton	Gold, Silver, Lead, Copper
Lead Carbonate Group	Silverton	El Banco Mines Company	50 Columbia St., Bangor, Me.	Gold, Silver, Lead, Copper (c)
Little Nation	Howardsville	Davis and Johnson	Howardsville	Gold, Silver, Lead, Copper, Zinc
North Star Sultan	Silverton	North Star Sultan Mining Co.	430 U. S. National Bank Bldg., Denver	Gold, Silver, Lead, Copper, Zinc
Old Hundred	Silverton	Dresser Mining Company	Box 448, Silverton	Gold, Silver, Lead, Copper, Zinc
Royal Charter (m)	Howardsville	Davis and Johnson	Howardsville	Gold, Silver, Lead, Copper, Zinc
Shenandoah Dives (m)	Silverton	Shenandoah Dives Mining Company	1000 Grand Ave. Temple, Kansas City, Mo.	Gold, Silver, Lead, Copper
Silver Lake (a) (m)	Silverton	American Smelting and Refining Company	441 Equitable Bldg., Denver	Gold, Silver, Lead, Copper, Zinc
Sunnyside (m)	Eureka	Sunnyside Mining and Milling Co.	Eureka	Gold, Silver, Lead, Copper, Zinc

## OPERATING MINES IN SAN MIGUEL COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Alta (a)	Telluride	John M. and George G. Wagner	Telluride	Gold, Silver, Lead (c)
Butterfly-Terrile	Ophir	Butterfly Consolidated Mines, Inc.	2432 North 28th St., Milwaukee, Wisconsin	Gold, Silver, Lead, Copper (c)
Carbonero	Ophir	Carlo Girardi	Ophir	Lead, Silver, Zinc
Columbine Group	Telluride	Columbine Gold Mining Company	Dolores	Gold, Silver (c)
Fairview	Telluride	C. V. Nordgren	Telluride	Gold, Silver
Purdy Lease	Ophir	Purdy Lease	Ophir	Gold, Silver
Silver Bell (a)	Ophir	R. A. Cebel	Augusta, Wisconsin	Gold, Silver, Lead, Copper, Tungsten (c)
Smuggler-Union	Telluride	Denver Metal and Machinery Co.	Denver	Gold, Silver

OPERATING MINES IN SUMMIT COUNTY, 1930

Name	Location	Operator	Address	Character of Product
Bullion	Montezuma	Montezuma Metals Corporation	Montezuma	Gold, Silver, Lead, Copper
Chief Tunnel Group	Frisco	C. C. Masterson and Assoc.	Frisco	Gold, Silver, Lead (c)
Dunkin	Breckenridge	Dunkin Leasing Company	Breckenridge	Gold, Silver, Lead (c)
Edna M.	Frisco	E. D. Blodgett	1244 Main St., Grand Junction	Gold, Silver, Lead
Fredonia (a)	Breckenridge	Fredonia Lease	1027 9th St., Golden	Gold, Silver, Lead
Hunklory	Dillon	Summit Mining and Milling Co.	Byers	Copper (c)
Jerry Tunnel (a)	Montezuma	Florida Mining Company	725 U. S. National Bank Bldg., Denver	Gold, Silver, Lead
Jumbo	Breckenridge	Jumbo Properties, Inc.	708 Colorado Bldg., Denver	Gold, Silver, Lead, Copper
King Solomon	Frisco	King Solomon Mining Co.	526 Mining Exchange Bldg., Denver	Gold, Silver, Lead, Copper, Zinc
McDowell	Alma	McDowell Mines, Inc.	Alma	Gold, Silver (c)
New York Tunnel	Montezuma	Wigton and Long Co.	Oklmulgee, Okla.	Gold, Silver, Lead
Owl Tunnel	Breckenridge	Aco Mining Company	Room 717, 415 Lexington Ave., New York, N. Y.	Gold, Silver, Lead
Pennsylvania	Montezuma	Consolidated Pennsylvania Mines, Inc.	1301 A St., Lincoln, Nebraska	Gold, Silver, Lead, Zinc
Pilot	Montezuma	George Robinson	Breckenridge	Gold, Silver, Lead
Roberts Tunnel	Montezuma	Marlin Mining, Milling and Power Company	Montezuma	Gold, Silver, Lead, Zinc (c)
Silver Queen	Kokomo	Production Mines Company	Box 704, El Paso, Texas	Gold, Silver, Lead
Tiger	Breckenridge	Royal Tiger Mines Company	Tiger	Gold, Silver, Lead
War Eagle	Montezuma	A. E. Mansfield and Assoc.	616 University Bldg., Denver	Gold, Silver, Lead

OPERATING MINES IN TELLER COUNTY, 1930

Name	Location	Operator	Address	Character of Product	
Abe Lincoln	Cripple Creek	Henry Martin and Assoc.	Box 132, Cripple Creek	Gold	
Ajax	Victor	Granite Gold Mining Company	Mining Exchange Bldg., Colorado Springs	Gold	
Block 54 of Stratton Estate	Cripple Creek	J. O. B. Keener	Cripple Creek	Gold	
(a)	Operated for part of the year only.	(c)	No production reported in 1930	(m)	Mill operated in connection with mine

## OPERATING MINES IN TELLER COUNTY, 1930—Continued

Name	Location	Operator	Address	Character of Product
Block 55 of Stratton Estate.....	Cripple Creek.....	J. E. West.....	Cripple Creek.....	Gold
Gold Chisel.....	Cripple Creek.....	William Smith and Assoc.....	Box 122, Cripple Creek.....	Gold
Colorado City.....	Victor.....	Colorado City Leasing Company.....	308 Florissant St., Cripple Creek.....	Gold
Contact Vein.....	Cripple Creek.....	United Gold Mines Company.....	Box 86, Colorado Springs.....	Gold
Cresson.....	Elkton.....	Cresson Cons. Gold M. and M. Co.....	Exchange National Bank Bldg., Colorado Springs.....	Gold
Elkton.....	Elkton.....	Elkton Company.....	Exchange National Bank Bldg., Colorado Springs.....	Gold
Elkton Dump.....	Elkton.....	H. H. Seblatter and Assoc.....	Victor.....	Gold
El Paso.....	Cripple Creek.....	New El Paso Mines, Inc.....	404 Patterson Bldg., Denver.....	Gold
Empire State.....	Victor.....	Patricia M. and M. Co.....	1401 Blake St., Denver.....	Gold
E. Porter Gold King.....	Cripple Creek.....	T. L. Hummcutt and Assoc.....	Victor.....	Gold
Fairview.....	Cripple Creek.....	United Gold Mines Co.....	Exchange National Bank Bldg., Colorado Springs.....	Gold
Gold Pinnacle.....	Cripple Creek.....	Mexican Gold and Silver Mining Co.....	1109 Alexander Bldg., San Francisco, California.....	Gold
Golden Rod.....	Cripple Creek.....	Golden Rod Mining and Milling Co.....	Box 182, Cripple Creek.....	Gold
Golden Terry.....	Cripple Creek.....	Cripple Creek Eagle Gold Mining Co.....	2018 Goodnight Ave., Pueblo.....	Gold
Hooster.....	Cripple Creek.....	M. and W. Leasing Company.....	60 Independence Building, Colorado Springs.....	Gold
Hub Claim.....	Cripple Creek.....	Walter D. Tatum and R. A. Welsgerber.....	Cripple Creek.....	Gold
Index.....	Cripple Creek.....	Fanny Fern Mines, Inc.....	320 C. A. Johnson Bldg., Denver.....	Gold
Kittie Wells.....	Cripple Creek.....	Jay Gould Mining Co.....	Cripple Creek.....	Gold
Los Angeles, etc.....	Cripple Creek.....	Lessees of the Stratton, Cripple Creek Mining and Development Co.....	Box 178, Colorado Springs.....	Gold
May Queen.....	Cripple Creek.....	Curtis Allstrum and Assoc.....	Cripple Creek.....	Gold
Mary McKinney.....	Anaconda.....	John Trankle and Assoc.....	Cripple Creek.....	Gold
Mercer Shaft.....	Cripple Creek.....	Doodle Bug Gold Mining Company.....	24-25 Midland Block, Colorado Springs.....	Gold
Monte Cristo Tunnel.....	Gillett.....	Kennard Knott.....	Cripple Creek.....	Gold
Ophir.....	Cripple Creek.....	Henry Hartman and James Clifford.....	Cripple Creek.....	Gold
Peru Dyke.....	Clyde.....	Peru Gold Mining Assoc.....	1223 N. Prospect St., Colorado Springs.....	Gold
Phay.....	Victor.....	Phay Mining Company.....	1223 N. Prospect St., Colorado Springs.....	Gold
Portland.....	Victor.....	Portland Gold Mining Company.....	Victor.....	Gold
Red Umbrella.....	Cripple Creek.....	Charles Endsley.....	Cripple Creek.....	Gold
Sangre de Cristo.....	Cripple Creek.....	Golden Rod M. and M. Company.....	Cripple Creek.....	Gold
Solomon.....	Cripple Creek.....	Robush, Hoag and Robush.....	Cripple Creek.....	Gold
Strong.....	Victor.....	Strong Lease.....	Victor.....	Gold



## Theresa Shaft of Golden

Cycle.....	Goldfield.....	United Gold Mines Company.....	Exchange National Bank Bldg., Colorado Springs.....	Gold
Thompson.....	Elkton.....	H. C. Helms.....	Elkton.....	Gold
Vindicator, etc.....	Independence.....	United Gold Mines Company.....	Exchange National Bank Bldg., Colorado Springs.....	Gold
W. L. Fraction or Melvin Linwood.....	Cripple Creek.....	Ellis Milling and Mining Co.....	Box 44, Cripple Creek.....	Gold

(a) Operated for part of the year only.

(c) No production reported in 1930.

(m) Mill operated in connection with mine.

## OPERATING QUARRIES AND CLAY PITs, 1930

Town	County	Name	Product	Operator	Address
Lyons.....	Boulder.....	Lyons Red Granite.....	Granite.....	Lyons Red Granite Quarry.....	653 Perry St., Denver
Lyons.....	Boulder.....	St. Vrain.....	Sandstone.....	St. Vrain Red Sandstone Quarries.....	609 Interstate Trust Bldg., Denver
Niwot.....	Boulder.....	New Girl.....	Feldspar.....	Robert L. and John I. Browning.....	Niwot
Salida.....	Chaffee.....	Bowen.....	Granite.....	W. F. Hersberger and Assoc.....	Salida
Monarch.....	Chaffee.....	Burton.....	Limestone.....	Burton Quarries.....	Garfield
Monarch.....	Chaffee.....	Doctor.....	Limestone.....	Pueblo Lime Company.....	9th and Bradford Sts., Pueblo
Salida.....	Chaffee.....	English.....	Limestone and Marble.....	U. S. Marble Company.....	Temple Court Bldg., Denver
Salida.....	Chaffee.....	Mountain Cross.....	Granite.....	Mountain Cross Granite Corporation.....	Salida
Salida.....	Chaffee.....	Salida Granite.....	Granite.....	Salida Granite Corporation.....	Salida
Salida.....	Chaffee.....	Yule.....	Granite.....	William Yule.....	Salida
Wetmore.....	Custer.....	Harms.....	Silica Rock.....	John E. Harms.....	Wetmore
Larkspur.....	Douglas.....	Charles Brainerd.....	Silica Sand.....	Charles Brainerd.....	Larkspur
Silica.....	Douglas.....	Helmer Fire Clay.....	Fire Clay.....	T. L. and George Helmer.....	Box 94, Littleton
Silica.....	Douglas.....	Helmer Limestone.....	Limestone.....	T. L. and George Helmer.....	Box 94, Littleton
Silica.....	Douglas.....	Helmer Red Clay.....	Clay.....	T. L. and George Helmer.....	Box 94, Littleton
Silica.....	Douglas.....	Helmer White Sand.....	Silica Sand.....	T. L. and George Helmer.....	Box 94, Littleton
Castle Rock.....	Douglas.....	Johnson Clay.....	Plastic Clay.....	Johnson and Tunnelcliff.....	Castle Rock
Castle Rock.....	Douglas.....	Scott Clay.....	Plastic Clay.....	Guy Anderson.....	Box 41, Castle Rock
Husted.....	El Paso.....	Husted.....	Fire Clay.....	Standard Fire Brick Co.....	Box 654, Pueblo
Manitou.....	El Paso.....	Ute Pass Green Stone.....	Green Sandstone.....	Manitou Green Stone Quarries.....	15th floor, San Jacinto Life Bldg., Beaumont, Texas
Manitou.....	El Paso.....	Western.....	Limestone.....	Western Lime Company.....	551 Equitable Bldg., Denver
Canon City.....	Fremont.....	B. D.....	Silica.....	Diamond Fire Brick Co.....	9th and Santa Fe, Canon City
Wellsview.....	Fremont.....	Blue Lime.....	Limestone.....	Holly Sugar Corporation.....	Golden Cycle Bldg., Colorado Springs
Canon City.....	Fremont.....	Burnito.....	Ganister.....	S. Vernon St. John.....	1130 Mason Ave., Canon City



## OPERATING QUARRIES AND CLAY PITS, 1930—Continued

Town	County	Name	Product	Operator	Address
Calceite	Fremont	Calceite	Limestone	{ Colorado Fuel and Iron Co.	Continental Oil Bldg., Denver
Portland	Fremont	Colorado Portland	Limestone and Shale	{ Ameriann Beet Sugar Co.	444 Steel Bldg., Denver
Cotopaxi	Fremont	Cotopaxi	Shale	Colorado Portland Cement Co.	Denver National Bldg., Denver
Canon City	Fremont	Dailey	Granite	Standard Granite Company	Cotopaxi
Canon City	Fremont	Deer Hill	Silica Rock	Frank Hoover	Parkdale
Canon City	Fremont	Doionite	Fire Clay	Diamond Fire Brick Co.	9th and Santa Fe, Canon City
Canon City	Fremont	Eight Mile Park	Dolomite	Thomas and Frankenberg	401 Tenth Ave., Canon City
Shavano	Fremont	Federal	Silica Rock	Standard Fire Brick Co.	Box 654, Pueblo
			Granite	{ Mountain Cross Granite Co.	Salida
				{ Corporation	Salida
Canon City	Fremont	Flint	Fire Clay and Silica Rock	Diamond Fire Brick Co.	Canon City
Coaldale	Fremont	Gypsum	Gypsum	T. A. Gilray	Coaldale
Canon City	Fremont	McIntyre Gulch	Silica Rock	Frank Hoover	Parkdale
Canon City	Fremont	Meyers	Feldspar, Mica	B. O. Halsted and Assoc.	Florence
Canon City	Fremont	Miller	Feldspar	L. D. Miller	Box 215, Canon City
Texas Creek	Fremont	Oak Creek	Granite	Verl D. Coleman	1025 North Cedar St., Colorado Springs
Wellsville	Fremont	Old Waldo	Limestone	Salida Lime Rock Company	Box 417, Salida
Texas Creek	Fremont	Rose Pink	Granite	Salida Granite Corporation	Salida
Canon City	Fremont	Shaw Park	Silica	Diamond Fire Brick Co.	Canon City
Canon City	Fremont	Shipley	Feldspar	Robert A. Shipley	Elks Home, Florence
Canon City	Fremont	Swastika	Fire Clay	Diamond Fire Brick Co.	Canon City
Canon City	Fremont	Twin Mountains	Marble	U. S. Marble Company	403 Temple Court Bldg., Denver
Wellsville	Fremont	Wellsville Travertine	Travertine	Olson Brothers	2217 Elizabeth St., Pueblo
Canon City	Fremont	Zingheim Mica	Mica, Feldspar, Beryl	E. E. Zingheim	Box 190, Orchard Ave., Canon City
Glenwood Springs	Garfield	Glenwood	Limestone	Holly Sugar Corporation	Golden Cycle Bldg., Colorado Springs
Marble	Gunnison	Yule	Marble	Yule Colorado Marble Co.	Proctor, Vermont
Mustang	Huerfano	Chamblin	Fire Clay	Standard Fire Brick Co.	Box 654, Pueblo
Mustang	Huerfano	Chamblin	Sandstone	Standard Fire Brick Co.	Box 654, Pueblo
Golden	Jefferson	Apex No. 10	Clay	Grant Parfet	Golden
Golden	Jefferson	Bertrand	Granite	J. B. Bertrand, Inc.	301 Union Station, Denver
Golden	Jefferson	Binder	Clay	Denver Pressed Brick Co.	219 Temple Court Bldg., Denver
Golden	Jefferson	Coors	Plastic Clay	Coors Porcelain Co.	Golden
Golden	Jefferson	Crucible	Fire Clay	Colorado Crucible and Clay Company	Box 1107, Denver
Golden	Jefferson	Fire Clay	Fire Clay	Denver Fire Clay Co.	1742 Champa St., Denver
Golden	Jefferson	Fire Clay	Fire Clay	Grant Parfet	Golden

Golden.....	Jefferson.....	Golden.....	Fire and Plastic Clay.....	Golden Clay Mining Co.....	Box 292, Golden
Golden.....	Jefferson.....	Johnson.....	Fire Clay.....	Western Clay and Manufacturing Company.....	4045 Lowell Blvd., Denver
Golden.....	Jefferson.....	Lindsay.....	Plastic Clay.....	George W. Lindsay.....	Golden
Golden.....	Jefferson.....	Moffit.....	Fire Clay.....	Grant Parfet.....	Box 1107, Denver
Golden.....	Jefferson.....	Oranhood.....	Clay.....	Denver Pressed Brick Co.....	213 Temple Court Bldg., Denver
Golden.....	Jefferson.....	Rockwell.....	Clay.....	Estate of Geo. W. Parfet.....	Golden
Golden.....	Jefferson.....	Rubey.....	Clay.....	H. M. Rubey Clay Co.....	Golden
Golden.....	Jefferson.....	Terra Cotta.....	Plastic Clay.....	North Western Terra Cotta Co.....	West 1st and Unatilla St., Denver
Laporte.....	Larimer.....	Boettche r.....	Cement Rock.....	Colorado Portland Cement Co.....	Denver National Bldg., Denver
Laporte.....	Larimer.....	Clark.....	Limestone.....	Clark Quarries, Inc.....	Box 503, Fort Collins
Loveland.....	Larimer.....	Gypsum.....	Gypsum.....	U. S. Gypsum Co.....	300 West Adams St., Chicago, Illinois
Loveland.....	Larimer.....	Loveland.....	Clay.....	Loveland Brick and Tile Clay Products Co.....	Loveland
Bellvue.....	Larimer.....	Josefson.....	Limestone.....	Josefson Brothers.....	Bellvue
Trinidad.....	Las Animas.....	Trinidad.....	Clay and Shale.....	Trinidad Brick and Tile Co.....	Trinidad
Creede.....	Mineral.....	Ultimate.....	Clay.....	Peerless Clay and Mineral Co.....	721 West 3rd St., Pueblo
La Junta.....	Otero.....	La Junta.....	Shale.....	La Junta Clay Products, Inc.....	La Junta
Pueblo.....	Pueblo.....	Eller Slag Pump.....	Slag.....	Arthur and Allen.....	Box 472, Pueblo
Lime.....	Pueblo.....	Lime.....	Limestone.....	Colorado Fuel and Iron Co.....	Continental Oil Bldg., Denver
Pueblo.....	Pueblo.....	Philo Slag.....	Slag.....	Arthur and Allen.....	Box 472, Pueblo
Stone City.....	Pueblo.....	Stone City.....	Fire and Plastic Clay.....	Pueblo Clay Products Co.....	9th and Bradford Sts., Pueblo
Pueblo.....	Pueblo.....	Summit.....	Clay.....	Summit Pressed Brick and Tile Co.....	13th and Erie Sts., Pueblo
Stone City.....	Pueblo.....	Turkey Creek.....	Fire Clay, Gypsum, Building Stone	Pueblo Quarries, Inc.....	310 Central Block, Pueblo
Pueblo.....	Pueblo.....	Vulcan.....	Fire Clay.....	Standard Fire Brick Co.....	Box 654, Pueblo

## OPERATING MILLS AND SMELTERS, 1930

Character of Plant	Town	County	Operator	Address
Arsenic and Cadmium Refinery.....	Denver.....	Adams and Denver.....	American Smelting and Refining Co.....	120 Broadway, New York, N. Y.
Boulder Ore Smelter.....	Boulder.....	Boulder.....	Boulder Ore Sampling Co.....	Boulder
Tungsten Ore Smelter.....	Boulder.....	Boulder.....	Manu Ore Milling Company.....	Box 167, Boulder
Cyanidation.....	West Colorado Springs.....	El Paso.....	Golden Cycle Corporation.....	\$00 Exchange National Bank Bldg., Colorado Springs
Zinc Oxide.....	Canon City.....	Canon City.....	Empire Zinc Company.....	Canon City
Electric Power Plant.....	Lake City.....	Hinsdale.....	R. D. Webb.....	Minden, Louisiana
Lead Smelter.....	Leadville.....	Lake.....	American Smelting and Refining Co.....	120 Broadway New York, N. Y.

## OPERATING MILLS AND SMELTERS, 1930—Continued

Flotation .....	Leadville.	Lake.	Leadville Zinc-Lead Co., Inc....Leadville
Lead Smelter .....	Durango.	La Plata.	American Smelting and Refining Co. ....120 Broadway, New York, N. Y.
Concentration and Flotation.....	Ouray.	Ouray.	The Home Company.....Ouray
Concentration .....	Ouray.	Ouray.	Ouray Concentrating Company...Ouray
Mica Crushing .....	Pueblo.	Pueblo.	General Mica, Inc.....447 Thatcher Bldg., Pueblo
Clay Crushing and Grinding.....	Pueblo.	Pueblo.	Peerless Clay and Mineral Inc..421 West 3rd St., Pueblo

## OPERATING PLACERS AND DREDGES, 1930

Name	Town	County	Operator	Address
Penn-Nevada Dredge.....	Granite.	Chaffee.	Penn-Nevada Corporation.....	28 St. Nicholas Bldg., Pittsburgh, Pa.
B. and I. Placer No. 1.....	Idaho Springs.	Clear Creek.	Idaho Springs Building and Improvement Association.....	Idaho Springs
Myers Placer.....	Rollinsville.	Gilpin.	Frank Myers.....	Rollinsville
Rocky Mountain Placer.....	Blackhawk.	Gilpin.	Edward Manion.....	1776 Krameria St., Denver
Jackrabbit Placer.....	Lay.	Moffat.	Lee Webb.....	Lay
Timberlake Placer.....	Craig.	Moffat.	Gold Production Corporation.....	709 Equitable Bldg., Denver
Bemrose Placer.....	Breckenridge.	Summit.	Buffalo Exploration and Mining Co. ....	McIntyre Bldg., Colorado Springs
Blue River Dredge.....	Breckenridge.	Summit.	Continental Dredging Company.....	1716 California St., Denver
Dorset Placer.....	Kokomo.	Summit.	McNulty Leasing Company.....	Kokomo
Eureka Placer.....	Kokomo.	Summit.	McNulty Leasing Company.....	Kokomo
Storm King Placer.....	Breckenridge.	Summit.	Ben McGuire.....	Breckenridge
Washington Placer.....	Breckenridge.	Summit.	James H. Teller.....	University Bldg., Denver



